AR TARGET SHEET

The following document was too large to scan as one unit, therefore, it has been broken down into sections.

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SECTION: 2 OF 5

DOCUMENT #: RPP-13774, Rev 002

TITLE: SST System Closure Plan

- *Specification for Pressure Vessel Design and Fabrication*, 24590-WTP-3PS-MV00-TP001
- *Seismic Qualification Criteria for Pressure Vessels*, 24590-WTP-3PS-MV00-TP002
- *Specification for Pressure Vessel Fatigue Analysis*, 24590-WTP-3PS-MV00-TP003

Piping and Pipe Support Design

The design code of the WTP piping and pipe supports is ASME B31.3 Code (ASME 1996), as well as the DOE seismic requirements. In compliance with DOE seismic requirements (DOE 1996), response spectrum method or UBC (UBC 1997) static method is used for the seismic analysis of the piping systems.

Additional information for piping and pipe support design is included in the following documents, which are included in DWP Attachment 51 Appendices as indicated:

- *~~Ancillary Equipment~~ Material ~~Selection~~for Ancillary Equipment~~Description~~*, 24590-WTP-PER-M-02-002 (Appendix 7.9)
- *Piping Material Class Description*, 24590-WTP-PER-PL-02-001 (Appendix 4)
- *Ancillary Equipment Pipe Support Design*, 24590-WTP-PER-PS-02-001 (Appendix 7.5)

~~The codes and standards that will be followed for design and construction of the piping and supports are identified below:~~

~~□ASME B31.3 Code – *Chemical Plant and Petroleum Refinery Piping* (ASME 1996)~~

~~□ASME Section III Code – *Rules for Construction of Nuclear Facility Components* (ASME 1995)~~

~~□Code Case N-411 – *Alternative Damping Values for Response Spectra Analysis of Classes 1, 2, and 3 Piping, ASME Section III Code* (ASME 1998)~~

~~□Uniform Building Code (UBC 1997)~~

~~□ASME/ANSI B16.5 – *Pipe Flanges and Flanged Fittings* (ASME 1999)~~

~~□DOE-STD-1020-94 (DOE 1996)~~

~~Table 4-13 summarizes the seismic categories and design standards for piping and pipe supports.~~

4.2.2.1.2 Physical Information for Tanks

Tables 4-3 through Table 4-6 list current tank design information (capacity, materials of construction, and dimensions). The tank systems are grouped by plant and process system.

Tank operation is generally automated. However, operator intervention can be used when human decisions or approval are required for initiation and termination of a process operation. Descriptions of tank system operation for major WTP process systems are identified in sections 4.1 and 4.2.2.

4.2.2.2 Ancillary Equipment Requirements [D-2a(1)]

Information concerning ancillary equipment is provided in the following subsections.

4.2.2.2.1 Transfer or Pressure Control Devices

Several fluid transfer devices will be used in the WTP. These devices include~~:~~ mechanical pumps, reverse flow diverters, and steam ejectors. Breakpots and seal pots, although not fluid transfer devices, are an important component of vessel operations. These components are discussed in the following sections.

Mechanical Pumps

Mechanical pumps will be used for operations that require high-flow pumps (such as through the evaporator circuits) or high-pressure head pumps (such as for pumping a waste stream through ultrafiltration circuits). Mechanical pumps will be located in process cells, process rooms, or caves. In general, mechanical pumps will be repaired in place, or removed to a maintenance area. However, remotely maintained pumps will be used in areas where maintenance activities would result in a significant radiation dose to the operators.

For normal process operating sequences, mechanical pumps and associated valves will be controlled by the process control system. In systems where off-normal conditions would require pump shutdown, the design will include an alarm mechanism ~~which~~ that will also trip the transfer device. The pump system is designed to allow for the drainage of liquid from the pump, and for the introduction of flush liquids at the end of transfers to reduce residual contamination.

Reverse Flow Diverters

Reverse flow diverters will provide for the maintenance-free pulsed or metered transfer of liquids or slurries throughout the treatment process. A reverse flow diverter does not need to be fully submerged in order to remove the contents of a vessel, and it maintains a small and predictable volume of tank contents following its use. Operation of the reverse flow diverter is cyclical, following timed phases: suction phase, drive phase, and blowdown. ~~Figure 4A-120 and~~ The following paragraphs ~~and figures in Attachment 51~~ describe ~~and illustrate~~ a typical reverse flow diverter system arrangement~~. Figure 4A-121 illustrates a typical flow diverter~~.

Suction phase: In the suction phase, the secondary automatic valve A is open, admitting air to the suction jet pump. Valve B is shut and liquid is drawn from the supply tank through the reverse flow diverter and into the charge vessel. The suction ejector is designed so that it cannot produce a vacuum capable of lifting liquid higher than a certain valve known as the "suction lift". After a short time, the liquid reaches this "suction lift" height and stops, then valve A is shut.

Drive phase: When valve A is shut, valve B is opened, admitting air to the drive nozzle. Air passes through the nozzle and pressurizes the charge vessel. Liquid is forced across the reverse flow diverter and into the delivery pipe. The delivery pipe is quickly filled with liquid that flows into the delivery vessel.

Blowdown phase: When the charge vessel is nearly empty, valve B is shut; no air is supplied to either jet pump. The compressed air in the charge vessel passes back through the paired jet pumps, down the vent pipe, and into vessel vent system.

Shortly after blowdown begins, the pressure in the charge vessel falls below the delivery head, and the flow of liquid into the delivery vessel is halted. The liquid in the delivery vessel then falls back down the pipe, across the reverse flow diverter, and into the charge vessel. After a short time, the pressure in the charge vessel falls to zero (gauge). The cycle is now complete.

Steam Ejectors

Steam ejectors are used to transfer process liquids, or to reduce the operating pressure of a system by gas removal. They empty liquid from vessels by means of suction lift, using a simple control system. ~~A typical arrangement of a steam ejector system is shown in Figure 4A-122Attachment 51.~~

An automated control valve supplies high-pressure steam to the steam ejector. This steam accelerates through a nozzle, creating a differential pressure along a submerged suction leg within the vessel. The pressure than forces the liquid up the suction pipe. This effect is known as *striking*. The steam then conveys the liquid to the destination vessel, normally via a breakpot. Control is established using liquid level instrumentation in the vessel being emptied, and using a temperature indicator, such as a thermocouple, within the breakpot.

Seal Pots

A seal pot is a type of hydraulic seal. A hydraulic seal is used primarily to maintain a separation between vessel vent or ~~off-gas~~ offgas systems for feed and receipt vessels. This separation is necessary to prevent migration of airborne contamination between the vessels. Without the seal, airflow could occur due to the different pressures in the vent systems. The seal is a slug of liquid in the interconnecting ~~pipework~~pipe work that remains after each liquid transfer is completed, blocking airflow between vessels.

The seal can be provided by constructing a simple "U" shape in the piping. Different piping arrangements are used for different purposes. A seal pot is a small vessel with one (inlet or outlet) pipe submerged in the liquid slug in the lower part of the pot, while the other pipe terminates in the top of the pot, above the static liquid level. The pot may be provided with a level indicator or alarm, if necessary, to ensure adequate liquid level. Periodic liquid additions may be needed to maintain the seal, especially if the pipeline is infrequently used. ~~Figure 4A-123 illustratesAn illustration of a typical seal pot is provided in Attachment 51.~~

Breakpots

The main function of the breakpot is to reduce the amount of ~~radioactive~~ mixed waste material entrained into the vessel ventilation system. Breakpots are provided on transfer lines that use steam ejectors for moving ~~radioactive liquors~~liquids by pressure flow. These types of transfers create the potential for higher containment of ~~radioactive~~ mixed waste contamination. Breakpots function to convert steam from pressure ~~-~~flow to liquid gravity flow, thereby reducing both the effluent loading on the downstream vessel ventilation treatment system and the ~~radioactive~~

mixed waste contamination levels in the vessel vent ductwork. Breakpots also serve a secondary purpose by providing a siphon break for other transfer systems where siphoning could occur.~~ A diagram of a breakpot is shown provided in Figure 4A-124Attachment 51.~~

Breakpots are typically placed at a high point in the discharge line from the steam ejector. Liquid will be pumped into the breakpot through an inlet nozzle in its wall. The incoming liquid will be directed towards a baffle. Within the baffle, non-condensed steam and gases will disengage. The breakpot will be self-draining; the liquid will drain through the breakpot discharge pipe to the destination vessel.

Above the inlet nozzle(s) will be a packed bed where disentrainment of the gas stream will occur. The exiting gas from the packed section will pass into the vessel ventilation system. The packed bed can be washed periodically using a wash ring permanently installed above the packed bed~~. Within the packed bed, a thermocouple will be located inside a sheath to measure temperature~~.

4.2.2.2.2 Bulges

Bulges are intended ~~for systems/~~to allow hands-on maintenance ~~on~~of equipment ~~that are not radioactively "hot"~~ after process fluids are flushed from the bulge piping and components~~ to allow hands-on maintenance~~. Bulges provide shielding to personnel during process operation and allows vulnerable or failure prone components to be located outside the process environment. The cell wall provides shielding between the cell and the bulge interior. The bulge includes shielding and contamination control as needed, depending on the process fluid within the bulge piping. A typical bulge consists of a metal frame attached to the cold-side wall of a process cell~~,~~; the frame is used to support the piping and components as well as the shielding plates (usually steel), which are bolted to the frame.~~ A diagram of a typical bulge is shown in Figure 4A-127Attachment 51.~~

There are two classifications of bulges used at the WTP. One is a "process" bulge; the other is a "service" bulge. The process bulge contains valves, pumps, piping, etc. The service bulge contains valves used to transfer reagents, steam, etc., to the in-cell process equipment. The design of the two bulges is similar.

Bulges are equipped with several wash systems, facilitating washing both internal and external piping, components, and bulge confinement surfaces. Decontamination of the equipment internals and associated piping is achieved by externally connecting a flushing system located on the outside of the bulge. Wash fluids could be water or more aggressive media such as nitric acid, provided compatibility with the bulge materials is ensured~~. bulges are internally lined with a stainless steel liner and are equipped with a sump, drain, and sump level instrumentation. The drains are connected to the plant wash system~~.

Additional information on process bulges may be found in *Process Bulge Design and Fabrication* (24590-WTP-3PS-MX00-TP001), located in DWP Attachment 51, Appendix 7.7.

4.2.2.2.3 Description of WTP Piping System

Detailed information on piping is included in *Piping Material Class Description* (24590-WTP-PER-PL-02-001), located in DWP Attachment 51, Appendix 4.

Interplant Piping Transfer Lines

Waste feed from the DST system will be transported to the WTP via the waste transfer lines.

The waste feed transfer lines will be ~~a~~ double-walled pipe. The inner pipe will be constructed of stainless steel, while the outer pipe will be constructed of carbon steel. The carbon steel outer pipe will be coated with a corrosion-resistant material. In addition, the coated outer pipe for the waste transfer lines from the DST to the pretreatment plant will be surrounded by insulation and a seamless high-density polyethylene outer shell. This extra layer of protective material will isolate the waste transfer lines from soil. The waste transfer lines between the pretreatment plant and the other WTP process plants will not have this extra barrier from the soil, but will be cathodically protected as described later in this section.

A leak detection system will be provided for the entire length of the waste transfer line. Pumping will be terminated, and reception of waste feed from the DST system unit will stop, when a leak is ~~sensed~~ identified by the leak detection system.

The inner pipe will be supported by guides, saddles, support keys, or anchors within the outer pipe. The inner pipe will transport waste and maintain the pressure boundary, while the outer pipe will provide secondary containment for the inner pipe. The piping system will be buried under a minimum depth of soil for radiation shielding. The minimum depth of soil will be finalized at the detail design phase and will be not less than the 2 ~~foot~~ ft freeze depth. A heat trace system is not required for pipes buried below freeze depth.

The piping system will have a continuous slope down toward the pretreatment plant. Released liquids resulting from leaks to the outer pipe can be removed as required by WAC-173-640(4)(b). The piping system will be designed to allow water flushing to occur in both directions.

Liquid Effluent Transfer Lines

Liquid effluent generated at the WTP will be routed to the pretreatment plant for recycling through the WTP or disposal to the LERF and ETF. An effluent line will be routed from the pretreatment plant to the LERF and ETF. This line is a buried pipe, constructed of materials that are compatible with the waste, under a minimum ~~two feet~~2 ft of soil serving as freeze protection. The pipes will have a continuous downwards slope towards the LERF and ETF, and will be designed to maintain structural integrity. A leak detection system will be provided for the LERF/ETF waste transfer lines.

Intraplant Piping

Within plants, the pipelines associated with the tank system will be single-walled. Secondary containment will be provided for piping within the plants by double-walled pipe or partially lined process cells, process rooms, or caves. If needed, other containment methods such as a bulge or concrete ducts with liners will be provided at appropriate locations. The bulge or concrete ducts will be provided with a low point which will drain to process cells, process rooms, or caves. The leak detection equipment located within the process cells, process rooms, and caves will warn of a piping leak through alarms.

Piping between plants and the two outdoor tanks at the pretreatment plant will be double-walled below grade and below the freeze line, similar to the waste transfer line.

Cathodic Protection

An ~~electrically powered~~impressed current cathodic protection system will be used for eliminating or mitigating corrosion on underground ~~tanks and~~ piping. The cathodic protection system will maintain a negative polarized potential ~~within a range of approximately -0.850 milivolts relative to~~between the protected pipe and a saturated copper/copper sulfate reference electrode~~. An automatically controlled, impressed current cathodic protection system is used to maintain the negative polarized potential~~.

The impressed current cathodic protection system uses direct current provided by a rectifier that is powered from the ~~site P~~plant's normal ~~120-volt alternating current or~~ 480 ~~volt~~ Vac power system. The direct current from the rectifier ~~flows to~~is connected across the buried ~~or submerged impressed current~~ anode wire and the protected pipe. The current ~~then~~ flows from the anode wire, ~~(~~which is positive, ~~terminal)~~ through the electrolyte, to the ~~cathode~~protected pipe, ~~(~~which is negative, ~~terminal)~~ completing the electrical circuit.

An annual survey, recommended by NACE International (formerly the National Association of Corrosion Engineers), ~~standards~~ will be performed on the overall system~~. Additional information on inspections is provided in Chapter 6 of this application~~. Test stations will be ~~located to in the field~~provided to ~~facilitate~~ permit ~~testing via~~ potential measurements~~-readings~~. Additional information on inspections is provided in Chapter 6.

The following waste transfer lines ~~use the~~are provided with cathodic protection ~~system~~ at the WTP. The waste transfer lines are double encased and constructed of materials that are compatible with the waste:

~~Incoming waste feed lines to the pretreatment plant~~

- Mixed waste transfer lines between the pretreatment plant and the HLW vitrification plant
- Mixed waste transfer lines between the pretreatment plant and the LAW vitrification plant
- Mixed waste transfer line between the analytical laboratory and the pretreatment plant
- The incoming DOE waste feed pipelines that interface with the WTP pipelines are not cathodically protected; therefore, the waste feed lines routed between the DOE interface point and the pretreatment plant (which are similarly configured) are not intentionally cathodically protected. They are, however, bonded at the crossing of the plant service air piping between the pretreatment plant and the HLW vitrification plant on the opposite end (which is adjacent protected piping). The waste feed lines, therefore, may receive small amounts of protective cathodic protection current in the area where they are bonded. This

area is defined as the "zone of influence". Bonding is required to eliminate stray electrical currents that may occur in the zone of influence and thereby eliminate the possible corrosion process. The waste feed lines are also provided with test stations at both ends to allow potential tests that will indicate if corrosion is a concern.

- Radioactive/dangerous waste effluent transfer lines to ~~the~~ ETF/LERF

4.2.2.2.4 Description of Foundations

Tank systems containing mixed waste ~~that~~ will be located indoors in process cells or caves, which will be integral parts of the pretreatment plant, analytical laboratory, the LAW vitrification plant, and the HLW vitrification plant with the exception of two outdoor tanks. Therefore, the design requirements of the tank systems will be met by the structural integrity of the plants. WTP compliance with ~~Uniform Building Code~~ UBC seismic design requirements, found in DWP Attachment 51, ~~Chapter 4, Supplement 1~~ Supplement 1, provides the seismic design requirements for the WTP. The outdoor tanks will be located outside of the pretreatment plant on a protectively-coated concrete pad and concrete berm. The concrete pad for these tanks will be sufficient to support the tanks.

Additional information on the design criteria, load definitions, load combinations, and methodology for the structural design and analysis may be found in *Secondary Containment Design* (24590-WTP-PER-CSA-02-001), located in DWP Attachment 51, Appendix 7.5.

4.2.2.3 Integrity Assessments [D-2a(2)]

~~This section discusses assessment of the structural design of the tanks and foundation.~~

A written assessment of the adequacy of the design~~, and the structural integrity and suitability~~ of tank systems~~, including ancillary equipment, will be prepared. The assessment will be reviewed and certified by an independent qualified registered professional engineer, consistent with Page II-5 of OSWER Policy Directive #9483.00-3, to attest that the tank systems are adequately designed for managing dangerous waste. The assessment will~~ and miscellaneous treatment systems will be prepared on a system-by-system basis. Separate reports are prepared for tanks, tank system ancillary equipment, and associated secondary containment systems. Each assessment will be reviewed and certified by an independent, qualified, registered professional engineer to attest that the tank and miscellaneous treatment systems are adequately designed for managing dangerous waste. Each assessment will include an evaluation of the foundation, structural support, seams, connections, pressure controls, compatibility of the waste with the materials of construction, and corrosion controls for each mixed waste ~~tank~~ management system, as appropriate. Assessment reports are located in DWP Attachment 51, Appendix 8.11 for the pretreatment plant, Appendix 9.11 for the LAW vitrification plant, and Appendix 10.11 for the HLW vitrification plant. ~~The certification will read as follows:~~

~~*"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the*~~

~~*information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."*~~

~~The tank systems will be located indoors, except the vessels located outside the pretreatment plant (process condensate vessels, V45028A/B). The two outdoor tanks will be located on a concrete pad with concrete secondary containment.~~

~~Information regarding the Tank System Design Assessment is included in Appendices 8.10, 9.10, 10.10, 11.10, and 12.10.~~

4.2.2.4 Additional Requirements for Existing Tanks [D-2a(3)]

Tanks and vessels to be permitted in the WTP will be newly constructed; pre-existing tanks will not be used. Therefore, the requirements of this section do not apply.

4.2.2.5 Additional Requirements for New Tanks [D-2a(4)]

Installation of tank systems will be performed in a manner designed to prevent damage to the tank system. The WTP ~~will~~ uses an independent, qualified installation inspector, or an independent qualified registered professional engineer ~~(IQRPE)~~ to perform tank system installation inspections. Inspection activities will include testing tanks for tightness, verifying protection of ancillary equipment against physical damage and stress, and evaluating evidence of corrosion. The inspections will document weld breaks, punctures, coating scrapes, cracks, corrosion, and other structural defects. Installation inspections will conform to consensus-recognized standards. Inspection findings and corrective actions, as appropriate, will be documented in ~~a~~ post-inspection reports~~. Additional information is provided in Appendices 8.11, 9.11. 10.11, 11.11, and 12.11~~.

Additional information describing the installation of tank systems and associated~~how~~ inspections ~~of tank systems~~ are ~~performed is~~ provided in *Installation of Tank Systems*, ~~(~~24590-WTP-PER-CON-02-001~~)~~~~., located in DWP Attachment 51, Appendix 8.12. Details on tank system installations for the pretreatment plant, LAW and HLW vitrification plants, and the analytical laboratory are provided in DWP Attachment 51.~~

4.2.2.5.1 Additional Requirements for New On-Ground or Underground Tanks [D-2a(5)]

The majority of the tanks and vessels to be constructed in the WTP will be located within the pretreatment plant, the analytical laboratory, the LAW vitrification plant, and the HLW vitrification plant. Therefore, the requirements of this section do not apply to the indoor tanks.

The two outdoor ~~process~~ Process C~~c~~ondensate ~~tanks~~ Tanks located at the pretreatment plant (RLD-TK-00006A/B) will be located within a bermed and lined secondary containment system and will not be in direct contact with soil. The design of the outdoor tanks' concrete pad will address backfill, soil saturation, seismic forces, and freeze thaw effects. The ancillary piping for the unit will be in contact with the soil, and the effects of corrosion on the piping will be addressed in the final design.

4.2.2.6 Secondary Containment and Release Detection for Tank Systems [D-2b]

This section provides information about the secondary containment for tank systems that will contain mixed waste in the WTP. Descriptions of equipment and procedures used for detecting and managing releases or spills from tank systems are also provided.

A number of documents are provided in appendices to DWP Attachment 51 that provide detailed information regarding the design of the secondary containment system. These documents include the following:

- *Secondary Containment Design*, 24590-WTP-PER-CSA-02-001, located in Appendix ~~8~~7.5
- *Material Selection for Building Secondary Containment/Leak Detection*, 24590-WTP-PER-M-02-001, located in Appendix ~~8~~7.9
- *Leak Detection - Sump Level Measurement in Secondary Containment Systems*, 24590-WTP-PER-J-02-001, located in Appendix ~~9~~7.5
- *Flooding Volume for PT Facility*, 24590-PTF-PER-M-02-005, located in Appendix 8.8
- *Sump Data for PT Facility*, 24590-PTF-PER-M-02-006, located in Appendix 8.5
- *Flooding Volume for 28 Ft Level of PT Facility*, 24590-PTF-PER-M-03-001, located in Appendix 8.8
- *Flooding Volume for LAW Facility*, 24590-LAW-PER-M-02-003~~, located in Appendix 9.8~~
- *LAW Facility Sump Data*, 24590-LAW-PER-M-02-001, located in Appendix 9.8
- *Flooding Volume for HLW Facility*, 24590-HLW-PER-M-02-003, located in Appendix 10.8
- *HLW Facility Sump Data*, 24590-HLW-PER-M-02-001, located in Appendix 10.5

4.2.2.6.1 Secondary Containment System Requirements [D-2b(1)]

Most of the tanks systems containing mixed waste will be located within the plants, although two tanks will be located outside the pretreatment plant. Tank systems containing mixed waste that are located within the plants will be arranged within ~~various stainless steel-lined~~ process cells, process rooms, or caves ~~that will act as~~ provided with secondary containment liners or coatings. The outside tanks will be located on a coated, bermed, concrete pad within concrete berms that will ~~act as~~provide secondary containment.

The secondary containment systems will be designed, installed, and operated to prevent migration of waste or accumulated liquid to soil, groundwater, or surface water. The piping associated with the tank systems will be located in the process cells, process rooms, caves, berms, or bulges. Secondary containment for piping systems will be incorporated into the design.

The following subsections provide detailed descriptions of typical secondary containment systems that will be used at the WTP.

Process Cells

Process cells will be located within process plants. Process cells will typically be constructed of concrete walls to protect plant operators and the environment from radiological exposure and to prevent migration of waste or accumulated liquid to soil, groundwater, or surface water. ~~The process cells will house equipment and pipe work designed to require little or no maintenance for the duration of the WTP~~. Operator access to the process cells will not be allowed during normal ~~radioactive~~ operations.

The process cells ~~floors and portions of walls will be lined with stainless steel~~will be provided with secondary containment as required. The floor will be sloped to a collection sump to allow for collection and removal of accumulated liquid within the sump.

Process Rooms

Process rooms will be located in the LAW vitrification plant and will be very similar to process caves. Access to process rooms will not be allowed during normal ~~radioactive~~ operations. However, access will be allowed for certain areas within WTP for non-routine operations such as equipment replacement or maintenance. Process rooms will ~~have a stainless steel liner on the floor and portions of the walls, and/or will be sealed with a protective coating. The LAW melter gallery area will have a protective coating on the concrete floor and walls~~be provided with secondary containment as required. Systems within process rooms that manage mixed waste will have secondary containment (for example, the locally shielded melter and piping).

Caves

Caves will be located within process plants. Caves will typically be constructed with concrete walls thick enough to protect personnel from ~~radiological~~ exposure to mixed waste. Caves will house mechanical handling equipment designed for remote operation and maintenance. They will generally have ~~sealed lead glass~~ viewing windows and closed circuit television to allow observation of the cave operations and for overseeing remote maintenance. The cave floors and portions of the walls will be ~~lined with stainless steel~~provided with secondary containment as required. The floor of the cave will be sloped to a collection sump to allow for collection and removal of accumulated liquid within the sump.

Berms

Concrete berms will be used at the LAW ~~facility~~plant for the ~~c~~Condensate ~~c~~Collection ~~t~~Tank (LVP-TK-00001) and the two ~~outside pretreatment~~outdoor ~~p~~Process ~~c~~Condensate ~~t~~Tanks (RLD-TK-00006A/B) at the pretreatment plant. The berms will be of sufficient structural strength and height to contain the 100 ~~percent~~ % of the volume of the largest tank plus the amount of precipitation that results from the 24-hour, 25-year storm event. A protective coating will be applied to the concrete pad and a portion of the berms to prevent contaminant penetration into the concrete. The containment system will be designed to allow for the discharge of storm water after visual or other testing.

Sump and Secondary Containment Drain Systems

The sump and secondary containment drain systems for the three process plants and the analytical laboratory are described in the following sections. Systems will monitor and collect liquids managed in the system. Sumps and secondary containment drains will be provided with a stainless steel liner or equivalent to act as the secondary containment. The sumps within the process areas will provide a low point for each secondary containment~~. Wash rings may be provided within some process areas for equipment, vessel, and cell washing and decontamination operations~~. The sumps will serve the following functions:

- Low point containment
- Removal of material by means of sump emptying ejectors or pumps
- Sampling of material by means of sump sampling ejectors

The following sections describe ~~in detail~~ the ~~two~~ types of sumps used at the WTP and the secondary containment drains. Tables 4-7 through 4-10 summarize WTP sump information by plant.

Dry~~Type I~~ Sumps

~~Mechanical process areas dealing with mechanical handling operations and containing dry material will be provided with Type I sumps. The sump and stainless steel lining will provide secondary containment for areas managing mixed waste. In addition, some LAW vitrification plant process rooms will be equipped with Type I sumps. The sump will provide a low point collection for the infrequent washing of machinery or the cave floor, for general cleanliness or decontamination prior to maintenance or deactivation. In some caves, these sumps will also collect leakage from effluent system transfer pipes associated with or passing through the cave. Type I sumps are generally fitted with a leak detection device with alarm. Their contents are removed using mechanical or fluidic pumps. A diagrammatic representation of this sump type is shown in Figure 4A-125.~~Dry sumps are part of the secondary containment system provided for tank systems and wet miscellaneous treatment systems. Sumps are located at a low point in the secondary containment systems, and are equipped with leak detection instrumentation and corresponding alarm. Mechanical or fluidic pumps are used to remove liquid that may accumulate in the sump. Details of each sump are included in the sump data documents identified at the beginning of section 4.2.2.6.

~~Type II Sumps~~

~~These sumps will serve as the low point collection system for the stainless steel containment in a cell or mechanical cave where tank systems are present. The sump and stainless steel lining will provide secondary containment for the tanks and piping containing mixed waste. Type II sumps will be provided with a level detection and alarm device and a washout and emptying pump. Type II sumps are generally associated with a high radiation cell environment containing treatment tanks and piping. They are provided with maintenance-free fluidic emptying systems, such as ejectors or reverse flow diverters. These are wet sumps in which water will always be present to provide liquid level detection via a pneumacator and trigger high and low level alarms, if necessary. A diagrammatic representation of a cell sump is shown in Figure 4A-126.~~

~~It should be noted that a number of process pipe transfer duct drains will provide drainage back to a suitable cell or Type II sump. Waste pipes will be routed to various destinations within the plant. Some of these routes will require the use of concrete ducts, to provide radiation shielding and secondary containment coverage for the piping. The transfer ducts will be provided with stainless steel lining that drains to a low point within the duct, which will be drained to a suitable cell or wet mechanical sump to provide leak detection and sampling access. The transfer ducts will be provided with wash systems for area cleanup in the event of a pipe leak.~~

Secondary Containment Drains

Many of the bulges and some process ~~rooms~~ areas will have secondary containment drains with remotely-removable plugs. This type of liquid collection system will be located in a low spot in the cell formed by the sloping floor. Liquid detection instrumentation will be present on the top of a remotely removable plug. After the plug is removed, liquid collected will gravity-drain to a collection vessel with a tank level indicator. The liquid managed could be waste released from a tank system, including ancillary equipment, or water used to wash the exterior of tanks or the walls of the room. ~~Liquid managed in the sump system could also be infrequently generated from the wash-down of cell walls or tank exteriors.~~

Design Requirements

~~The process cells, process rooms, or caves with mixed waste vessel or~~ Tank systems and wet miscellaneous treatment systems will be ~~partially lined with stainless steel, which will cover the floor and extend up the sides of the process cell or cave to a height~~provided with secondary containment that can contain 100 ~~percent~~ % of the volume from the largest tank within the ~~process cell or cave~~containment area. Fire suppression water is included as appropriate in determining the height of the secondary containment ~~The height of the liners will not take into account fire suppression material, as the tanks will not manage ignitable waste. The concrete surfaces of the ceiling and the wall above the liner will be covered with a coating that is compatible with the waste feed to provide a splash shield zone. A sealant, compatible with the liner and the waste feed and wall coating, will be used to seal the liner-to-wall interface.~~ Table 4-11 ~~presents~~ summarizes the calculated minimum liner height at the four process plants. ~~Calculations for the liner size necessary in each cell and cave are available upon request~~The flooding volume documents identified above present the secondary containment height for each ~~facility~~plant.

A concrete berm with protective coating will be used for the pretreatment plant outdoor tanks. This secondary containment area will be capable of holding 100 ~~percent~~ % of the volume from the largest tank within the berm, plus the precipitation from a 25-year, 24-hour rainfall event, as required under WAC 173-303-640(4)(e)(i)(B).

The WTP uses consensus-recognized standards to ensure ~~that the process cells, process rooms, caves, or berms provide~~ secondary containment ~~with~~ systems have sufficient strength, thickness, and compatibility with waste. The design includes an engineered structural base to protect ~~the cells, caves, berms and tank systems~~ against failure resulting both from excess force applied during catastrophic events or settlement, and from the stress of daily operation. In the event of a spill or release, the ~~structural and foundation~~secondary containment design ~~for tank and process cells, process rooms, caves and berms~~ will prevent released mixed waste from reaching the environment, and will safely contain the waste until it can be transferred to an appropriate collection tank.

4.2.2.6.2 Management of Release or Spill to Sump and Secondary Containment Drain Systems [D-2b(1)]

~~Sumps collect vessel leakage, vessel overflow, and decontamination solutions used in cell and equipment wash down. The sump and cladding are provided to satisfy secondary containment requirements for vessels and piping containing liquid mixed waste.~~ The WTP uses ~~two types of sumps for different process conditions. If a cell has a personnel entrance and houses vessels, tanks, and piping that manage dangerous waste, a Type I, single lined sump is placed in the cell. If the cell is a non-accessible process cell and has welded piping, a Type II sump is utilized. In Type II sumps, water is always present, to ensure that sump level indicators are working. Additionally, water provides a ventilation seal that prevents airflow from entering vessel overflow piping when a vessel overflows to a sump~~a dry sump as part of the secondary containment and leak detection systems~~. Wash rings allow for sump wash down~~.

Sumps ~~have three level thresholds: high operational control; high level alarm; and cell high-high level alarm. When these level thresholds are reached, the process control system~~are instrumented to informs the operator to investigate the cause of the rising liquid level. ~~The cell liners~~Secondary containment systems are sloped to direct flow of leaks~~,~~ or spills~~, or liner wash solutions~~ to the sump~~. Process cell liners are made of stainless steel or equivalent material that satisfies regulatory requirements, and design life requirements~~. To remove liquid from the sumps in a timely fashion, sumps will be equipped with ~~steam ejectors~~ mechanical or fluidic pumps.

~~If a Type II sump is used, a small amount of water will be maintained in the sump during normal operating conditions. During normal operation, the water level will be maintained between the low and high operational controls. The operation control band limits will be set as close to each other as possible, and the alarm will be set above the high operational control to detect unusual level rises. The sump level will be constantly monitored. Typically, a moderate leak will generate a larger liquid volume than the amount of liquid that might be lost due to evaporation.~~

Abnormal rising of the liquid level in the sump will be investigated to determine its cause~~. In all cases, the cause for material in the sump will be determined~~. Mixed waste released from the primary system and collected in the sumps will be removed within 24 hours, or in as timely a manner as possible. If the released material cannot be removed within 24 hours, Ecology will be notified~~. After the sump content has been removed, the sump surfaces will be decontaminated using a wash-down system. Based on best management practices, a water flushing volume of approximately six sump volumes will be used to remove residual process water.~~

~~If a Type I sump is used, it will be equipped with a moisture probe to detect leakage. If liquid is detected in the Type I sump, similar procedures as described above for Type II sumps will be used to remove the content and decontaminate the sump surfaces.~~

~~If liquid is detected in the secondary containment drain, similar procedures to those described above for Type II sump will be used to remove drain contents and decontaminate drain surfaces.~~

4.2.2.6.3 Additional Requirements for Secondary Containment [D-2b(2)]

These requirements pertain to tanks in vault systems and double-walled tanks, which will not be used at the WTP. These requirements are not applicable at the WTP.

Ancillary equipment such as piping is addressed within ~~S~~section 4.2.2. Other types of ancillary equipment such as pumps, seal pots, and reverse flow diverters~~,~~ are ~~either located in stainless steel lined process rooms/cells or caves or are designed to provide their own~~provided with secondary containment. Inspection of ancillary equipment is addressed in Chapter 6.

4.2.2.7 Variances from Secondary Containment Requirements [D-2~~b(2)(c)~~]

No variances from secondary containment requirements are sought for the WTP tank systems. Tank systems will be provided with secondary containment ~~in the form of partially steel-lined or protectively coated process cells or rooms, caves and berms, as~~as identified in the flooding volume documents described in the previous sections.

4.2.2.8 Tank Management Practices [D-2d]

The following provides the basic philosophy for the WTP vessel overflow systems. Three types of barriers exist to prevent overfill of process equipment: preventive controls, detectors, and regulators. Preventive controls promote controlled filling within normal process ranges. Detectors recognize if a vessel is being overfilled and alert an operator. Lastly, if preventive controls and detectors fail to stop overfill from occurring, regulators trip a control sequence that stops inflow and/or initiates outflow. The ~~principle~~ principal design concept to control vessel overflow is to prevent an overflow from occurring. The engineering design will minimize the likelihood of tank, ancillary equipment, and containment system overflows, and over-pressurization, ruptures, leaks, corrosion, and other failures.

In general, overflows will be prevented by inventory control in conjunction with level monitoring. The fluid levels in a vessel will be maintained within low- and high-level ranges. Appropriate alarm settings will be used to note deviations from the designed settings. Automatic trip action will be designed to shut down feed to the vessel when the high-level settings are exceeded. These automatic trip actions will be provided for vessels with the potential for high operational and environmental impact in case of an accident or release.

Most of the WTP tank systems will be designed to incorporate minimal or zero maintenance requirements and will be based on a design life of approximately 40 years. ~~Intrusively,~~ The design emphasis of zero maintenance will minimize the likelihood of spills and overflows in the tank systems. In the event that the process controls fail to prohibit vessel overfilling, engineered overflows will be provided to prevent liquid from entering the vessel ventilation systems. ~~Non-pressure~~ Vessels that are ~~(~~nominally operating at atmospheric pressure~~)~~ will have a suitable gravity or engineered overflow system, unless an overflow can be shown not to be possible. Vessels or systems that normally operate at above atmospheric pressures will not be provided with overflows.

The following principles apply when designing an engineered overflow system:

- The overflow system for vessels must be instantaneously and continuously available for use.
- Overflowed process streams must be returned to the waste treatment process.
- Overflow systems must meet the requirements of ~~the~~ WAC 173-303, *Dangerous Waste Regulations*, Section 640, Tank Ssystems. In meeting these requirements, overflowing direct to the cell floor will only be considered as the last overflow in a cascaded system. Where an overflow is from a vessel to the cell, the overflow system will maintain segregation of the cell and vessel ventilation systems. The compatibility of the overflowing liquid and the recipient vessel will be considered.
- A vessel overflow line is sized to handle the maximum inflow to the vessel without the liquid level in the overflowing tank reaching an unacceptably high level. No valves or other restrictions are permitted in the overflow line. This line is also designed to prevent the buildup of material that could cause blockages.
- The overflow receiver is sufficiently sized to contain the overflow.
- Inspections will be performed on the various tank and overflow systems, using the example schedules described in DWP Chapter 6.

4.2.2.9 Labels or Signs [D-2e]

~~Accessible~~ Tanks ~~(i.e., the Pretreatment plant process condensate vessels, V45028A and V45028B) holding~~managing mixed or dangerous waste will be labeled according to the requirements of DWP permit conditions DWP III.10.E.5.e, for routinely non-accessible tanks, and DWP III.10.E.5.f, for tanks not addressed in DWP III.10.E.5.e.~~will be labeled provided with stainless steel engraved nameplates~~. They will inform employees and emergency personnel of the types of waste present, warn of the identified risks, and provide other pertinent information.

4.2.2.10 Air Emissions [D-2f] and [D-8]

This section describes air emissions from vessel ventilation systems and reverse flow diverter exhausts. Organic emissions from vents associated with evaporator or distillation units are also discussed.

4.2.2.10.1 Tank System Emissions [D-2f]

Most of the tanks will be connected to a vessel ventilation system to collect vapors. Vessel vents will be located on major tanks, breakpots, and other small vessels. Exhaust from reverse flow diverters and pulse jet mixers will also be collected.

4.2.2.10.2 Process Vents [D-8a]

The air emission regulations, specified under WAC 173-303-690 and 40 CFR ~~Part~~ 264 Subpart AA, apply to process vents associated with distillation, fractionation, thin-film evaporation, and air or steam stripping operations that manage mixed waste with total organic carbon concentrations of at least 10 parts per million by weight. The WTP does not use these regulated processes~~,~~; therefore, this regulation does not apply to the WTP.

4.2.2.10.3 Equipment Leaks [D-8b]

Regulations provided in WAC 173-303-691 and 40 CFR ~~Part~~ 264 Subpart BB contain the "Air Emission Standards for Equipment Leaks". These air emission standards do not apply to the WTP because waste feed entering the WTP contains less than 10 ~~percent~~ % total organic carbon by weight and is excluded under 40 CFR 264.1050(b).

4.2.2.10.4 Tanks and Containers [D-8c]

The regulations specified under WAC 173-303-692 and 40 CFR ~~Part~~ 264 Subpart CC do not apply to the WTP mixed waste tank systems and containers. These tanks and containers qualify as waste management units that are "used solely for the management of radioactive dangerous waste in accordance with applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act" and are excluded under 40 CFR 264.1080(b)(6). Containers bearing nonradioactive, dangerous waste, such as maintenance and laboratory waste, that is not excluded under 40 CFR 264.1080 (b)(2) or 40 CFR 264.1080(b)(8), will comply with the tank and container standards specified under 40 CFR ~~Part~~ 264 Subpart CC.

4.2.2.11 Management of Ignitable, Reactive and Incompatible Waste in Tanks [D-2g] and [D-2h]

Mixed waste from the DST system unit will initially be designated as both ignitable (D001) and reactive (D003). The D001 and D003 waste numbers will be as described in the waste analysis plan in DWP Attachment 51, ~~Chapter 3,~~ Appendix 3A. The vessels will be located in a manner that meets the National Fire Protection Association (NFPA) buffer zone requirements for vessels, as contained in Tables 2-1 through 2-6 of the *NFPA-30 Flammable and Combustible Liquids Code* (NFPA 1981). The vessels will be designed to store the waste in such a way that it will be protected from materials or conditions that could cause the contents to ignite or react. Vessel contents will be constantly mixed and will be actively vented to process stacks, which will be equipped with vapor collection and treatment systems that will manage emissions. Further information on waste numbers is contained in DWP Attachment 51, ~~Chapter 3,~~ Appendix 3A.

Ignitable or reactive waste may be generated from laboratory or maintenance activities. This waste will be accumulated and managed in compliance with regulatory requirements, in approved containers. Potentially incompatible waste generated from laboratory or maintenance activities will not be stored in the tank systems.

A potential for incompatibility may exist, for example when nitric acid is used to elute waste components from ion-exchange column resins that were previously regenerated with sodium hydroxide. To minimize a reaction, water flushes will be performed between batches.

Process reagents that could react with waste in the tank systems will be stored in areas that are separated by physical barriers from process tanks. Potentially incompatible wastes generated from laboratory or maintenance activities will not be stored in proximity to each other in the tank systems.

4.2.3 LAW and HLW Miscellaneous ~~Unit~~Treatment Sub-Systems [WAC 173-303-680 and WAC 173-303-806(4)(i)]

~~This section describes LAW and HLW melter operations conducted at the WTP. The thermal treatment miscellaneous units will be melters and will be used to immobilize dangerous and radioactive waste constituents by vitrification. There will be three miscellaneous units in the LAW vitrification plant (LAW melters 1, 2, and 3) and one miscellaneous unit in the HLW vitrification plant (HLW melter).~~
The LAW vitrification system and HLW vitrification system consist of the vitrification melters, offgas treatment equipment, and associated equipment. The melters immobilize mixed waste in a glass matrix. The LAW vitrification systems and the HLW vitrification system contain two melters each. The following sections provide additional information on the vitrification systems.

Other miscellaneous treatment sub-systems, and their associated process control features, are described in section 4.2.2.

4.2.3.1 Melter Capacity and Production

For the ~~LAW~~ melters, throughput is defined on the basis of quantity of glass waste produced. In turn, the quantity of glass waste produced depends on the degree to which the ~~LAW~~ feed can be incorporated into the glass ~~waste~~ matrix. The maximum design throughput of the LAW ~~melter~~ Melter systems will be approximately 15 metric tons per day of glass waste for each melter and approximately ~~45~~ 30 metric tons per day ~~as maximum possible~~ throughput ~~for the LAW vitrification plant~~. The ~~maximum operating~~ production rate of the HLW ~~melters~~ Melters is approximately 3 metric tons per day for each melter and approximately melter ~~1.5~~6 metric tons per day throughput.

4.2.3.2 Description of Melter Units [WAC 173-303-806(4)(i)(i)]

The LAW ~~melter~~ Melter systems are located in ~~a~~ the melter galler~~y~~ies and the HLW ~~m~~Melters ~~is~~ are housed within ~~a~~ the melter caves as ~~shown~~ depicted in the general ~~layout~~ arrangement plan and section permit drawings, which are found in DWP Attachment 51, Appendix 9.4 for the LAW vitrification plant and Appendix 10.4 for the HLW vitrification plant~~Appendix 4A~~. The following subsections provide detailed descriptions of the melter units.

Low-Activity Waste Melter Units
Figure 4A-48 provides a sketch of an LAW Melter. ~~The~~ Each LAW ~~melter~~ Melter (LMP-MLTR-00001/2) is a rectangular furnace, lined with refractory material, with an outer

steel casing. An additional outer steel casing with access panels will be provided to enclose the LAW ~~melter~~Melter. This outer steel casing is designed to provide local shielding and containment. Each LAW M~~m~~elter has a nominal design capacity of approximately ~~10 to~~ 15 metric tons of glass waste per day. Each will have a molten glass surface area of approximately 108 ft^2. Each of the ~~three~~ two LAW melters has external dimensions of approximately~~.~~ 26 × ~~19~~ 21 × 16 ft high, and weighs approximately ~~450~~ 270 metric tons empty~~,~~ and ~~475~~ 290 metric tons with glass. The operating temperature of the melter is between ~~950~~ 1100 °C and ~~1,250~~1200 °C.

The locally shielded LAW ~~melter~~ Melter (LMP-MLTR-00001/2) will be operated and maintained in a personnel access area. The melter will be maintained at a lower pressure than the surrounding room to prevent escape of contaminants. Consumable melter parts will be replaced through access panels. The melters will be transported in and out of the gallery on a rail system. A transporter will move the melters to and from the LAW vitrification plant.

The melter refractory package is designed to serve as a mechanical, thermal, and electrical barrier between the molten glass residing in the melter and the melter shell.

The refractory package is housed in a steel shell and provides ~~ultimate~~ containment for the molten glass. Active cooling on the exterior of the melter is provided by water jackets. The water jackets will be in the intermediate loop of a two-loop system that will transfer heat from the LAW ~~melter~~ Melter through heat exchangers to cooling towers. The intermediate loop containing the water jacket will be a closed system that isolates the water circulating through the water jacket from the water in the cooling water loop circulating to the cooling tower. ~~Radioactive~~ Mixed waste material leaking into the intermediate loop cooling water will be prevented from becoming an inadvertent discharge via the cooling tower. The refractory package will provide adequate containment if there is a temporary loss of cooling. Penetrations in the melter system are sealed using appropriate gaskets and flanges. This system is designed for plenum temperatures of up to 1,100 °C. The LAW melter lid is composed of steel and refractory material layers.

Each LAW ~~melter~~ Melter (LMP-MLTR-00001/2) will use two independent discharge chambers. An air lift pumps molten glass from the bottom of the melter pool, through a riser, into a discharge chamber, and poureds it into an ILAW container. The ILAW is then allowed to cool, forming a highly durable borosilicate glass waste form within the container.

~~Waste~~ Spent LAW ~~m~~Melters will initially be managed within the LAW locally shielded melter gallery containment building unit. ~~Waste~~ Spent LAW M~~m~~elters will be removed from the melter gallery and transported using a bogie transport and rail system. If necessary, the melter exterior surfaces will be decontaminated~~. The waste melters will be stored at the melter storage area 1 or 2 prior to disposal at~~ prior to transfer to a Hanford Site TSD unit.

High-Level Waste Melter Units

Figure 4A-54 provides a sketch of an HLW Melter. ~~The~~ Each HLW ~~melter~~ Melter (HMP-MLTR-00001/2) is a rectangular furnace, lined with refractory material, with ~~an~~ outer

~~steel~~ casings. ~~It has~~They have four compartments: a glass tank, two discharge chambers, and a plenum just above the glass tank. The tanks ~~is~~ are lined with refractory material designed to withstand corrosion by molten glass.

The HLW ~~melter~~ Melter systems consists of ~~one~~ two melters ~~with the capability for a second melter~~. Each HLW ~~m~~Melter (HMP-MLTR-00001/2) is designed for glass production rates up to 3 metric tons per day (MTG/d). ~~The HLW melter system has a nominal design capacity of 1.5 metric tons of glass waste per day and a maximum capacity of three metric tons per day.~~ The operating temperature of the melter is between 950 °C and 1,250 °C. The HLW ~~melters~~ Melters ha~~s~~ve~~s~~ a molten glass surface area of approximately 40 ft^2. The HLW ~~m~~Melters ha~~s~~ve~~s~~ external dimensions of approximately ~~12 × 15 × 12 ft~~11' ft ~~H~~high × 14 ft' ~~D~~deep × 14' ft ~~W~~wide. The glass contained in a full HLW ~~melter~~ Melter has a volume of approximately 145 ft^3 and weighs approximately 9.1 metric tons. ~~The~~ An entire melter, including the supporting structure and transport mechanism, weighs approximately 90 metric tons empty~~,~~ and approximately 99 metric tons full.

The HLW ~~melters~~ Melters (HMP-MLTR-00001/2) ha~~s~~ve~~s~~ been designed to be remotely operated and maintained. Remote maintenance will be performed by a power manipulator, overhead crane, and auxiliary hoist, or by through-wall master-slave manipulators. The melter will be positioned within the HLW vitrification plant for ease of access and viewing of both discharge chambers during operations, and for viewing access to the melter lid to facilitate removal and replacement of subcomponents, if needed. A rail and bogie transport system will facilitate remote removal and replacement of the entire melter structure.

The HLW ~~melters~~ Melters (HMP-MLTR-00001/2) will use a refractory package similar to the LAW melter to contain the molten glass. The refractory package is designed to serve as a mechanical, thermal, and electrical barrier between the molten glass inside the melter and the melter shell.

The HLW ~~melters~~ Melters will also use an ~~steel~~ outer shell, which, with the refractory package, will contain the molten glass and melter offgas. Active cooling on the exterior of the melter will be provided by a water jacket, which will be in a two-loop system that will transfer heat from the HLW ~~melter~~ Melter through heat exchangers to cooling towers. The loop containing the water jacket will be a closed system that isolates the water circulating through the water jacket from the water in the cooling water loop circulating to the cooling tower. ~~Radioactive~~ Mixed waste material leaking into the intermediate loop cooling water will be prevented from becoming an inadvertent discharge through the cooling tower. The refractory package will provide adequate containment should there be a loss of cooling. The HLW ~~melter~~ Melter lid will be constructed of a steel outer shell and insulated from the melter plenum by refractory material.

The HLW ~~melter~~ Melter will use two independent discharge chambers. Discharge will be achieved by transferring the molten glass from the bottom of the melter pool, through a riser, from which it will be poured into a stainless steel IHLW ~~container~~canister. Glass waste transfer will be accomplished through air lifting. The IHLW will then be allowed to cool, forming a highly durable borosilicate glass waste form.

Waste HLW ~~m~~Melters will be removed from the melter cave and placed in an overpack. The spent melter will be treated as newly generated waste, and will initially be managed within the HLW melter containment buildings. If necessary, the overpack will be decontaminated using a dry process. Waste HLW ~~m~~Melters will be stored in the ~~HLW or LAW out-of-service~~ melter storage facility.

4.2.3.3 Automatic Waste Feed Cut-Off System

The LAW and HLW ~~melters~~ Melters will be equipped with the ability to cut off waste feed. Automatic waste feed cut-off systems terminate feed to the ~~melter~~ Melter if a specified operating condition is exceeded.

This design approach is consistent with the WAC 173-303-680 regulatory requirements.

The LAW (LMP-MLTR-00001/2) and HLW (HMP-MLTR-00001/2) ~~melters~~ Melters are fed via air displacement slurry pumps that utilize pressurized air as the motive force. ~~It supplies~~These pumps supply feed to the melters in slugs ~~which~~ that act to keep lines from plugging. The feed is injected into the melters through the feed nozzles on top of the ~~melter~~ Melter creating a "cold cap", where waste feed undergoes several physical and chemical changes. The glass product in the melter is then "air lifted" through the discharge chamber and into the glass container. Melter offgas is generated from the vitrification of LAW and HLW of which the rate of generation is dynamic and not steady state. The offgas is then carried away and treated via a dedicated offgas system.

The melter systems are designed to minimize the need for automatic waste feed cut-off functions. Control of melter level and plenum pressure, process alarming, and optimized operating procedures will be in place to reduce the occurrences of interlocking. Given the processing speeds and the relatively slow rates of change in the operating states of the melter, ~~operations~~ operators should have adequate time to react to upset conditions. An example of the slow rate of change can be seen in the volume of feed per air displacement slurry pump feed cycle when increasing melter level. Each pump cycle adds approximately ~~one~~ 1 gallon of slurry into the melter. At ~~one~~ 1 gallon of volume, the liquid level rises no greater than 0.01 in. inside the melter. This provides ample time for operator response.

Previous operating experience with similar melters has shown that two types of operating conditions existed that warranted automatic waste feed cut off: ~~(~~1) high melter pressure~~,~~ and ~~(~~2) high melter glass level. These interlocks have been sufficient to allow continued melter operations without inadvertent feed cut off signals, yet provide a sufficient safety margin.

4.2.3.4 Offgas Treatment System

The offgas treatment system will remove steam, aerosols, entrained particulates, decomposition products, and volatile contaminants that are generated from the vitrification processes and the vessel ventilation systems. The ~~principle~~ principal constituents contained in the melter offgas stream are as follows:

~~□Air in-leakage and purges into the melter~~
~~□Water vapor evaporated from the melter feed~~
~~□Acid gases generated from anion decomposition (i.e., nitrogen oxide and sulfur oxide)~~
~~□Aerosols from dried melter feed and melter cold-cap reaction solids~~

- Nitrogen oxides from decomposition of metal nitrates in the melter feed
- Chloride, fluoride, and sulfur as oxides, acid gases, and salts
- ~~Radionuclide p~~Particulates and aerosols
- Entrained feed material and glass

A detailed description of the current offgas treatment trains for the LAW (LMP-MLTR-00001/2) and HLW (HMP-MLTR-00001/2) ~~melters~~ Melters is provided in s~~S~~ections 4.1.4 and 4.1.5, respectively.

4.2.3.5 ~~Maximum Achievable Control Technology (MACT) Standards~~Reserved

~~The WTP melter systems are thermal treatment units classified as miscellaneous units in Washington Administrative Code (WAC) 173-303-680. The dangerous waste regulations require that permits for miscellaneous units include such terms, conditions, and provisions that are necessary to protect human health and the environment and are appropriate for the miscellaneous unit being permitted. Ecology has determined that regulations that are most appropriate to apply to the melters and offgas systems are found in applicable sections of the incinerator requirements (WAC 173-303-670). These standards are known as Maximum Achievable Control Technology (MACT) and were promulgated by the EPA in September 1999 (64 *FR* 52828). In April 2001, Ecology provided guidance to the WTP regarding the regulatory standards they will be applying to the melter systems, including certain requirements contained in the MACT rule for hazardous waste combustors (Ecology 2001). The requirements are outlined in the following:~~

~~**Pollutant**~~	~~**Ecology-directed requirement**~~
~~Principle Organic Dangerous Constituents~~	~~99.99% destruction and removal efficiency~~

~~dscm~~

~~□Emissions corrected to 7% oxygen basis~~
~~□TEQ is toxicity equivalence defined in 40 CFR 63.1201(a)~~
~~□dscm is dry standard cubic meter~~
~~□ppmv is parts per million by volume~~
~~□Rolling average is the average of all one minute averages over the averaging period [40 CFR 63.1202(a)]~~

~~On July 24, 2001, the United States Court of Appeals, District of Columbia (D.C.) Circuit, vacated the MACT rule for hazardous waste combustors and ordered the EPA to rewrite the emission standards (United States Court of Appeals, D.C. Circuit 2001a). On October 26, 2001,~~

~~the EPA, together with other litigants, filed a joint motion asking the Court to delay issuance of a mandate that would vacate the MACT emission standards for hazardous waste combusters (United States Court of Appeals, D.C. Circuit 2001b). On November 1, 2001, the Court granted the joint motion. As a result, the mandate to vacate the emission standards has been stayed to February 14, 2002.~~

~~DOE intends that the melter systems be designed and constructed so that they operate in compliance with the appropriate and applicable standards. Environmental performance demonstrations during cold commissioning of the HLW and LAW vitrification plants will be used to verify compliance with the DRE and other as applicable air emission standards. Ecology's guidance also indicated that some periodic demonstration testing will need to be performed after the WTP has begun processing radioactive wastes (Ecology, 2001).~~

~~The WTP contractor has undertaken a review of the requirements outlined above to determine the feasibility of implementing them in a radioactive environment. A proposal regarding compliance with the MACT requirements will be prepared by the date identified in the DWPA Completion Schedule.~~

4.2.3.6 Physical and Chemical Characteristics of Waste [WAC 173-303-680(2)(a)(i)]

A description of the waste characteristics of the LAW and HLW feeds is presented in DWP Attachment 51, Chapter 3 (see Appendix 3A). The immobilized waste generated by the vitrification processes will be in the form of glass that maintains its chemical and physical integrity during long-term storage. The waste analysis plan (Appendix 3A) describes the types and frequency of analysis that will be performed on the glass waste.

4.2.3.7 Treatment Effectiveness Report [WAC 173-303-806(4)(i)(iv)]

A treatment effectiveness report evaluating the performance of the miscellaneous ~~units~~treatment sub-systems, and their effectiveness in treating the LAW and HLW, ~~is provided~~will be located in DWP Attachment 51, ~~Appendices~~ Appendix 9~~.16~~ for LAW and Appendix 10 for HLW~~.16~~. ~~Sampling and analyses to be performed on the glass waste are described in the waste analysis plan (Appendix 3A). Air monitoring and analysis requirements are addressed in the WTP air permits~~The report will use the results of the environmental performance demonstration and the risk assessment activities to document treatment effectiveness of miscellaneous treatment sub-systems.

4.2.3.8 Environmental Performance Standards for Melter Systems [WAC 173-303-680(2)]

An environmental performance demonstration will be conducted to demonstrate the efficiency of the LAW and HLW ~~melter~~ Melter systems and their respective air pollution control systems. Emissions from the LAW and HLW systems will be sampled and analyzed during an environmental demonstration performed during cold commissioning. The data developed during the environmental performance demonstration will support the screening-level risk assessment, which will support the development of environmental performance standards for the LAW and HLW ~~melter~~ Melter systems.

The operational activities of the WTP include methods intended to ensure proper performance of equipment and processes. These methods include sampling of materials, use of direct process controls, development of equipment life specifications and ongoing maintenance.

4.2.3.8.1 Protection of Groundwater, Subsurface Environment, Surface Water, Wetlands and Soil Surface [WAC 173-303-680(2)(a) and (b)]

The LAW ~~melters~~ Melters will be located in the LAW melter gallery (L-0112) within the LAW vitrification plant. The HLW ~~melters~~ Melters will be located in the HLW melter caves (H-0117, H-0106) within the HLW vitrification plant. Both plants are designed to comply with standards that ensure protection of the surface and subsurface environments. The vitrification plants will be completely enclosed and are designed to have sufficient structural strength and corrosion protection to prevent collapse or other structural failure. In addition, the melter systems, melter feed systems, and related piping will be provided with secondary containment, to minimize the potential for release. The LAW melter gallery (L-0112) and the HLW melter caves (H-0117, H-0106) will be permitted as containment buildings and are described in ~~S~~section 4.2.4.

Floors within the vitrification plants will be protected in a manner consistent with the intended usage of the space. ~~The process room floor and walls of the LAW melter gallery will be protectively coated.~~ The floor and portions of the walls of HLW ~~melter~~ Melter cave will be partially lined with stainless steel. Nonradioactive materials usage areas requiring heavy equipment will have concrete floors with hardener and sealer finishes.

The *Hanford Facility Dangerous Waste Permit Application General Information Portion*, ~~S~~section 5.4 (DOE-RL 1998), provides climatological data, topography, hydrogeological and geological characteristics, groundwater flow quantity and direction, groundwater quality data, and surface water quantity and quality data for the area around the WTP.

4.2.3.8.2 Protection of the Atmosphere [WAC 173-303-680(2)(c)]

A risk assessment will be performed to evaluate the impacts of the WTP emissions on human and ecological receptors. Actual offgas emissions will be measured during an environmental performance demonstration that will be performed as part of the WTP commissioning activities. The data will be used during a screening-~~-~~level risk assessment that will be performed to determine ecological and human health risk. The emissions data~~,~~ and the results of the screening level risk assessment~~,~~ will be used to establish operating conditions for the melters that do not endanger human health and the environment.

4.2.3.9 Approach to Risk Assessment [WAC 173-303-680(2)~~-~~(c)(i) through (vii)]

A ~~screening level~~pre-demonstration test risk assessment is being conducted to evaluate ~~the environmental impacts~~any possible human health and ecological resource consequences posed by the thermal treatment of ~~miscellaneous~~mixed ~~units~~wastes. ~~It~~ The risk assessment will provide information about the potential terrestrial, aquatic, and food pathways for exposure of human and ecological receptors to dangerous waste constituents. This risk assessment will present the quantitative methods, detailed assumptions, and numerical parameters that will be used to estimate the nature, extent, and magnitude of potential ~~impacts~~ risks from operation of the WTP, and ~~will identify the~~the approach and computations will be in accordance with the government's guidance documents used in performing ~~the~~ such risk assessments.

Treated air emissions through the stack will be the only planned direct releases into the environment from the WTP ~~released directly into the environment~~. Other waste streams will be transferred to a permitted facility and will not be released directly into the environment. Thus, the ~~screening level~~pre-demonstration test risk assessment will focus primarily on air emissions.

Major components of the human health and ecological risk assessment process for evaluating airborne emissions will be as follows:

- Risk assessment work plan
- ~~Preliminary~~ Pre-demonstration test risk assessment
- Final risk assessment

The overall approach for the risk assessment will be to identify potential risks associated with various receptors, their locations, exposure pathways, and activity patterns in two broad exposure scenarios, as follows:

- Plausible exposure scenario
- Worst-case exposure scenario

The plausible exposure scenarios will be based on where potential receptors currently exist or may reasonably be expected to exist within the foreseeable future. The ~~worst-case exposure scenario will be based on~~ worst-case assumptions ~~regarding the~~ will be based on locations of ~~receptors, exposure pathways, and activity pattern. The plausible exposure scenario will be based on more realistic assumptions regarding the location of~~maximum concentration even though it is not expected that such receptors will ever actually exist at these locations. ~~It will~~Both scenarios will reflect current uses of the surrounding land and habitat~~,~~ and reasonable assumptions about future uses of the land and habitat.

During the environmental performance demonstration, emission samples will be collected and analyzed, and the data will be used to evaluate risk to the human ~~(including Native Americans)~~population and ecological ~~(including~~such as wildlife~~)~~ receptors. Operating conditions will be established for the WTP, which limit risks to human health and the environment to acceptable levels.

4.2.4. Containment Buildings

This section describes how these units are designed and operated, in accordance with the requirements of WAC 173-303-695, which incorporates 40 CFR~~Part~~ 264 Subpart DD, "Containment Buildings", by reference. Regulatory citations in this section list the applicable section of the CFR to make it easier for readers to find the requirement. A typical containment building is illustrated in Appendix 4A, Figure 4A-59.

There ~~will be twelve~~ are ~~a number of~~ twenty containment buildings at the WTP: ~~three~~ four located within the pretreatment plant; ~~three~~ six in the LAW vitrification plant; and ~~six~~ ten in the HLW vitrification plant. The regulated units are:

- Pretreatment hot cell containment building (P-0123)
- Pretreatment maintenance containment building (PM0124, P-0121A, P-0122A, P-0123A, P-0124, P-0124A, P-0125, P-0125A, P-0128, P-0128A)
- Pretreatment ~~air filtration~~filter package maintenance containment building (P-0223)
- Pretreatment air filter package containment building (P-0335)
- LAW LSM gallery containment building (L-0112)
- ILAW container finishing containment building (L-0109B/,L-0109C, L-01/09D/, L-0109E, L-0115B, L-01/15C, L-01/145D, L-0115E~~/16A/16B~~)
- LAW vitrification plant consumable import/export containment building (L-0119B)
- LAW vitrification plant C3 workshop containment building (L-226A)
- LAW pour cave containment building (L-B015A, L-B013C, L-B013B, L-B011C, L-B011B, and L-B009B)
- LAW container buffer storage containment building (L-B025C, L-B025D)
- HLW melter cave no. 1 containment building (H-0117, H-0116B, H-0310A)
- HLW melter cave no. 2 ~~containment buildings~~ containment building (H-0106, H-0105B, and H-0304A)
- IHLW ~~container weld containment building~~canister handling cave containment building (H-0136)
- IHLW ~~container~~ canister ~~decontamination~~swabbing and monitoring ~~building~~cave containment building (H-0133)
- HLW vitrification plant C3 workshop ~~containment building~~ containment building(H-0311A, H-0331/~~A/~~B)
- HLW ~~vitrification plant air filtration containment building~~filter cave containment building (H-010~~3/~~4)

~~□HLW vitrification plant drum transfer tunnel containment building~~

- HLW pour tunnel no. 1 (H-B032)
- ~~and~~ HLW pour tunnel no. 2 ~~(H-B032 and~~ (H-B005A)
- HLW drum swabbing and monitoring area (H-0126A, H-0126B, ~~and~~ H-B028)
- HLW waste handling area ~~(H-410, H-410A,~~ H-410B, and H-411)

Table 4-12 summarizes the units within the WTP. The following figures and drawings found in DWP Attachment 51~~Appendix 4A~~ provide further detail for the WTP containment buildings:

- ~~Typical system f~~Figure 4A-59 depicting common features ~~for each~~of containment buildings

- ~~Simplified~~ General arrangement figures and drawings showing locations of containment buildings
- Waste management area figures ~~and drawings~~ showing containment building locations to be permitted
- ~~Contamination/radiation area boundary figures showing contamination/radiation zones throughout the plants~~

Control of fugitive emissions from containment buildings is described in *Fugitive Emissions Control Description* (24590-WTP-PER-HV-02-001) ~~located in DWP Attachment 51, Appendix~~ .

The following sections address each of the ~~twelve~~ containment buildings.

4.2.4.1 Pretreatment Hot Cell Containment Building (P-0123)

The first containment building in the pretreatment plant is located in the central portion of the pretreatment plant~~,~~ and stretches nearly the entire length of the building.

The process equipment is remote handled in case of failure and is removed by an overhead crane or powered manipulator. Manipulators assist in the decontamination and remote repair. The unit also contains a crane and powered manipulator repair area. The failed equipment is placed inside disposal boxes and transported through a series of airlock and shield doors to a truck load-~~-~~out area on the outside of the building.

Process equipment, such as pumps, valves, and jumpers~~, and filters~~ are located in this containment building. Typical waste management activities performed in this containment building include~~, :~~ the removal and staging of failed, remote-handled process equipment prior to decontamination, repair, and/or packaging of waste for disposal. Jumpers connecting process equipment may leak waste when the jumper connection is broken. Although some decontamination capability is present in the pretreatment hot cell containment building, some quantities of waste, especially solids, will remain following decontamination. The design features associated with the pretreatment hot cell containment building, discussed below, ensure the capability to manage residual waste from process jumper leakage throughout the 40-year design lifetime of the pretreatment plant.

Pretreatment Hot Cell Containment Building Design
The pretreatment hot cell containment building is designed as a completely enclosed area within the pretreatment plant. It is designed to prevent the release of dangerous constituents and their exposure to the outside environment. The design and construction of the hot cell~~,~~ and the pretreatment plant exterior will prevent water from running into the plant. The approximate dimensions of the unit are summarized in Table 4-12.

Pretreatment Hot Cell Containment Building Structure
The pretreatment hot cell containment building will be a concrete-walled structure fully enclosed within the pretreatment plant. Therefore, structural requirements for the containment building will be met by the design standards of the pretreatment plant. The roof of the pretreatment plant

will consist of metal roofing, roof insulation, and vapor barrier. Rainwater run-off will be collected by roof drains and drainage systems with overflow roof drains. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the~~The~~ seismic requirements for the pretreatment plant ~~are presented in the *RPP-WTP Compliance with*~~meet or exceed the Uniform Building Code Seismic Design Requirements~~ identified in Attachment 51, Chapter 4, Supplement 1~~.

Pretreatment Hot Cell Containment Building Materials

The pretreatment hot cell containment building will be constructed of steel-reinforced concrete. The interior floor and a portion of the walls of the unit will be partially lined with stainless steel. The balance of the walls will have an impervious coating. ~~The roof of the pretreatment plant will consist of metal roofing, roof insulation, and vapor barrier. Rainwater run-off will be collected by roof drains and drainage systems with overflow roof drains.~~

Use of Incompatible Materials in the Pretreatment Hot Cell Containment Building

A partial stainless steel liner will be provided for this unit. Stainless steel will be compatible with the equipment waste that will be managed, which will include failed pumps, ultrafilters, and valves containing a minimal amount of waste constituents. Activities in the unit will include, but not be limited to, ~~to d~~decontamination, size reduction, and packaging the waste components into drums or waste boxes. Treatment reagents that could cause the liner to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the Pretreatment Hot Cell Containment Building

The pretreatment hot cell containment building is designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria identified in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the Pretreatment Hot Cell Containment Building

Prior to startup of operations, a certification by a qualified registered professional engineer that the pretreatment hot cell containment building meets the design requirements of 40 CFR 264.1101(a), (b), and (c) will be obtained.

Operation of the Pretreatment Hot Cell Containment Building

Operational and maintenance controls and practices will be established and followed to ensure containment of the waste within the pretreatment hot cell containment building as required by 40 CFR 264.1101(c)(1).

Maintenance of the Pretreatment Hot Cell Containment Building

The partial stainless steel lining of the unit will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The partial stainless steel liner will remain free of corrosion or other deterioration because it is compatible with materials that will be managed in the containment building. The failed equipment that will be managed in the containment building unit will be compatible with stainless steel. Only decontamination chemicals that are compatible with the liner will be used.

Measures to Prevent Tracking Wastes from the Pretreatment Hot Cell Containment Building
The pretreatment hot cell containment building is designed to isolate failed equipment from the accessible environment and to prevent the spread of contaminated materials. Very little dust is expected to be generated in the unit. Personnel access to the unit, which is classified as a C5 contamination area, will be restricted~~ due to radiological concerns~~. Waste leaving the unit may or may not be enclosed within containers~~. If necessary, these containers may be decontaminated in the unit prior to transportation to another permitted storage area~~. Equipment leaving the unit will be decontaminated before being released for removal.

~~Control of Fugitive Dust from the Pretreatment Hot Cell Containment Building~~
~~The following measures will be used to prevent fugitive dust from escaping the pretreatment hot cell containment building:~~

- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Greater negative air pressure in the unit compared to adjacent C2 units, to pull air into the unit and prevent backflow~~
- ~~Intake air through controlled air in-bleed units, with backflow prevention dampers, and air gaps around shield doors sized to prevent backflow~~
- ~~Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~
- ~~A multiple fan extraction system designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair~~

Procedures in the Event of Release or Potential for Release from the Pretreatment Hot Cell Containment Building
The design and operation of the unit makes it very unlikely that releases will occur. The design and operational measures will minimize the generation of dust and contain it within the unit. The ventilation system will also use negative air pressure to keep contamination from spreading to areas of lesser contamination~~, and will use two-stage HEPA filtration to reduce the release of particles. The ventilation system is designed with backup HEPA filters to provide redundant controls and to facilitate repairs or replacement~~. Offgas will be routed to the pretreatment ventilation system.

Inspections will identify conditions that could lead to a release. Such conditions will be corrected as soon as possible after they are identified. In the unlikely event that a release of dangerous wastes from the containment building is detected, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods that will be used to satisfy this requirement will be developed prior to the start of operations. These methods will be followed to repair conditions that could lead to a release.

Inspections of the Pretreatment Hot Cell Containment Building

An inspection program will be established to detect conditions that could lead to a release of wastes from the pretreatment hot cell containment building. The inspection and monitoring schedule and methods that will be used to detect releases from the unit ~~is~~ are included in Chapter 6.

4.2.4.2 Pretreatment Maintenance Containment Building (PM0124, P-0121A, P-0122A, P-0123A, P-0124, P-0124A, P-0125, P-0125A, P-0128, P-0128A)

The pretreatment plant will have a second area that meets the definition of a containment building. The pretreatment maintenance containment building comprises the majority of the east end of the building. Typical waste management activities performed in this containment building include~~:,~~ equipment maintenance, including decontamination, size reduction, and packaging of spent equipment. This unit consists of the interim storage, lag storage, manipulator decontamination and repair, resin handling, waste packaging, tool cribs, and sub-change~~, and filter overpack lidding~~ rooms. The unit will include hatches to import or export spent equipment. An overhead crane will facilitate movement of equipment and removal or placement of the spent equipment in the waste containers.

Pretreatment Maintenance Containment Building Design

The pretreatment maintenance containment building is designed as a completely enclosed area within the pretreatment plant. The unit is designed to prevent the release and exposure of dangerous constituents to the outside environment. The design and construction of the pretreatment plant exterior will prevent water from running into the plant. The roof of the pretreatment plant will consist of metal roofing, roof insulation, and a vapor barrier. Rainwater run-off will be collected by roof drains and drainage system with overflow roof drains. The approximate dimensions of the unit are summarized in Table 4-12.

Pretreatment Maintenance Containment Building Structure

The pretreatment maintenance containment building will consist of several rooms within the concrete-walled, fully enclosed pretreatment plant. Therefore, structural requirements for the containment building will be met by the design standards of the pretreatment plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the pretreatment plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements of the pretreatment plant are presented in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, as identified in Supplement 1.~~

Pretreatment Maintenance Containment Building Materials

The pretreatment maintenance containment building will be constructed of steel-reinforced concrete. The interior floor and portions of the walls of the unit will be -lined with stainless steel. The balance of the walls will have an impervious coating. ~~The roof of the pretreatment plant will consist of metal roofing, roof insulation, and a vapor barrier. Rainwater run-off will be collected by roof drains and drainage system with overflow roof drains.~~

Use of Incompatible Materials in the Pretreatment Maintenance Containment Building

A partial stainless steel liner will be provided for the unit. Stainless steel will be compatible with the equipment wastes that will be managed, which will include failed pumps, ultrafilters, and valves. Activities in the unit will be limited to decontamination, size reduction, and packaging the waste components into drums or waste boxes. Treatment reagents that could cause the liner to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the Pretreatment Maintenance Containment Building

The pretreatment maintenance containment building is designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria identified in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the Pretreatment Maintenance Containment Building

Prior to startup of operations, certification by a qualified registered professional engineer that the pretreatment maintenance containment building meets the design requirements of 40 CFR 264.1101(a), (b), and (c) will be obtained.

Operation of the Pretreatment Maintenance Containment Building

Operational and maintenance controls and practices will be followed to ensure containment of the waste within the pretreatment maintenance containment building as required by 40 CFR 264.1101(c)~~-~~(1).

Maintenance of the Pretreatment Maintenance Containment Building

The stainless steel lining of the unit will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The stainless steel liner will remain free of corrosion or other deterioration because it will be compatible with materials that will be managed in the containment building, which will include failed equipment. Only decontamination chemicals that are compatible with the liner will be used.

Measures to Prevent Tracking Wastes from the Pretreatment Maintenance Containment Building

The pretreatment maintenance containment building is designed to isolate failed equipment from the accessible environment and to prevent the spread of contaminated materials. A dust cleanup system will minimize the potential for dust to be tracked from the unit by humans or equipment. The containment building will be classified as a C3/C5 contamination area and, therefore, personnel access will be limited, and may be restricted~~ due to radiological concerns~~. Wastes leaving the unit may be enclosed within containers. If necessary, these containers will be decontaminated in the unit prior to transportation to ~~another~~ permitted storage area. Equipment leaving the unit will be decontaminated before being released for removal from the cell.

~~Control of Fugitive Dust from the Pretreatment Maintenance Containment Building~~

~~The following measures will be used to prevent fugitive dust from escaping the pretreatment maintenance containment building.~~

- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Greater negative air pressure in the unit compared with adjacent C2 units, to pull air into the unit and prevent backflow~~
- ~~Intake air through controlled air in-bleed units, with backflow prevention dampers, and air gaps around shield doors sized to prevent backflow~~
- ~~Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~
- ~~A multiple fan extraction system designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair~~
- ~~Personnel ingress and egress through airlocks and subchange rooms~~

Procedures in the Event of a Release or Potential Release from the Pretreatment Maintenance Containment Building

The design and operation of the unit makes it very unlikely that releases will occur. The design and operational measures that will be used will minimize the generation of dust and contain it within the unit. The ventilation system will also use negative air pressure to keep contamination from spreading to areas of lesser contamination~~ and will use two-stage HEPA filtration to reduce the release of particles~~.

~~Inspections will identify conditions that could lead to a release. Such conditions will be corrected as soon as possible after they are identified. The ventilation system is designed with backup HEPA filters to provide redundant controls and to facilitate repairs or replacement.~~

In the unlikely event that a release of dangerous wastes from the containment building is detected, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods that will be used to satisfy this requirement will be developed prior to the start of operations. These methods will be followed to repair condition that could lead to a release.

Inspections of the Pretreatment Maintenance Containment Building

An inspection program will be established as required under WAC 173-303-695 to detect conditions that could lead to the release of wastes from the pretreatment maintenance containment building. Such conditions will be corrected as soon as possible after they are identified. The inspection and monitoring schedule and methods that will be used to detect a release ~~is~~ are included in Chapter 6.

4.2.4.3 Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building (P-0223)

The pretreatment ~~air filtration~~filter package maintenance containment building is the third containment building within the pretreatment plant, located in the southeast portion of the plant. Typical waste management activities performed in this containment building include, waste storage, size reduction, decontamination, and equipment repair. A crane transports spent HEPA and HEME filters to a size reduction station and then places them inside a disposal container. The disposal container is then transported via cart, through an air lock and shield doors and to a load-out area for storage pending final disposal. The containment building also houses a hands-on crane decontamination and repair area.

Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building Design

The pretreatment ~~air filtration~~filter package maintenance containment building will be completely enclosed within the pretreatment plant, and will be designed to prevent the release and exposure of dangerous constituents to the outside environment. The design and construction of the pretreatment plant exterior will prevent water from running into the plant. The roof of the pretreatment plant will consist of metal roofing, roof insulation, and a vapor barrier. Run-off will be collected by roof drains and a drainage system with overflow drains. The interior floor and a portion of the walls will be lined with a protective coating. The approximate dimensions of the containment building are summarized in Table 4-12.

Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building Structure

Because the pretreatment ~~air filtration~~filter package maintenance containment building will be a concrete-walled structure fully enclosed within the pretreatment plant, its requirements will be met by the design standards of the pretreatment plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51~~, Chapter 4, Supplement 1~~ Supplement 1 provides documentation that the seismic requirements for the pretreatment plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements for the pretreatment plant are presented in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, contained in Supplement 1.~~

Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building Materials

The pretreatment ~~air filtration~~filter package maintenance containment building will be constructed of steel-reinforced concrete. A protective coating will be provided for the containment building.~~The interior floor and a portion of the walls will be lined with a protective coating. The roof of the pretreatment plant will consist of metal roofing, roof insulation, and a vapor barrier. Run-on will be collected by roof drains and a drainage system with overflow drains.~~

Use of Incompatible Materials for the Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building

~~A protective coating will be provided for the containment building.~~ The protective coating will be compatible with the wastes that will be managed in the unit, which will include spent HEPA and HEME filters. Activities in the unit will be limited to size reduction and waste packaging. Treatment reagents that could cause the protective coating to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building

The pretreatment ~~air filtration~~filter package maintenance containment building will be designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building

Prior to the start of operations, certification by a qualified registered professional engineer that the pretreatment ~~air filtration~~filter package maintenance containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because waste containing liquids will not be managed in the unit and waste will not be treated with liquids.

Operation of the Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building

Operational and maintenance controls and practices will be established to ensure containment of the waste within the pretreatment ~~air filtration~~filter package maintenance containment building, as required by 40 CFR 264.1101(c)(1).

Maintenance of the Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building

The protectively-coated concrete floor and walls of the unit will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The protective coating will be compatible with materials that will be managed in the containment building, which will include spent HEPA and HEME filters. No decontamination chemicals that are incompatible with the coated concrete will be used.

Measures to Prevent Tracking Wastes from the Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building

The pretreatment ~~air filtration~~filter package maintenance containment building is designed to manage spent HEPA and HEME filters. Conducting these activities in a C5 zone will prevent the spread of contaminated materials. Restricted personnel access and controlled movement of equipment into and out of the unit will decrease the possibility that waste will be tracked from the unit.

Personnel access to the pretreatment plant ~~air filtration~~filter package maintenance containment building, which is classified as a C5 contamination area, will be restricted~~ due to radiological concerns~~. Access to the unit will be allowed only under limited circumstances, thereby limiting the potential for contacting the waste and tracking it from the unit.

~~Control of Fugitive Dust from the Pretreatment Air Filtration Containment Building~~

~~The following measures will be used to prevent fugitive dust from escaping the pretreatment air filtration containment building unit:~~

- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Greater negative air pressure in the unit, compared with adjacent C2 units, to pull air into the unit and prevent backflow~~

~~□Intake air through controlled air in-bleed units, with backflow prevention dampers, and air gaps around shield doors sized to prevent backflow~~

~~□Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~

~~□A multiple fan extraction system designed to maintain negative pressure, and cascading air flow, even during fan maintenance and repair~~

~~□Personnel ingress and egress through airlocks and subchange rooms~~

Procedures in the Event of Release or Potential for Release from the Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building

Conditions that could lead to a release from the pretreatment ~~air filtration~~filter package maintenance containment building will be corrected as soon as possible after they are identified~~. The ventilation system and airlocks, the most likely sources of potential releases, will be designed with backup HEPA filters to facilitate repairs and replacement~~.

In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods that will be used to satisfy this requirement will be developed prior to the start of operations.

Inspections of the Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building

An inspection program will be established to detect conditions that could lead to a release of wastes from the pretreatment ~~air filtration~~filter package maintenance containment building. The inspection and monitoring schedule, and methods that will be used to detect releases from the unit, are included in Chapter 6.

4.2.4.4 Pretreatment Air Filter Package Containment Building (P-0335)

The pretreatment air filter package containment building is the fourth containment building within the pretreatment plant, in the southeast portion of the plant. Typical waste management activities performed in this containment building include waste storage, size reduction, decontamination, and equipment repair. A crane transports the spent HEPA and HEME filters to a size reduction station and then places them inside a disposal container. The disposal container is then transported via cart through an air lock and shield doors and to a load–out area for storage pending final disposal. The containment building also houses a dedicated crane maintenance area.

Pretreatment Air Filter Package Containment Building Design

The pretreatment air filter package containment building will be completely enclosed within the pretreatment plant, and will be designed to prevent the release and exposure of dangerous constituents to the outside environment. The design and construction of the pretreatment plant exterior will prevent water from running into the plant. The roof of the pretreatment plant will consist of metal roofing, roof insulation, and a vapor barrier. Run-off will be collected by roof drains and a drainage system with overflow drains. The approximate dimensions of the containment building are summarized in Table 4-12.

Pretreatment Air Filter Package Containment Building Structure

Because the pretreatment air filter package containment building will be a concrete-walled structure fully enclosed within the pretreatment plant, its requirements will be met by the design standards of the pretreatment plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the pretreatment plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements for the pretreatment plant are presented in *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, provided in Attachment 51, Chapter 4, Supplement 1.~~

Pretreatment Air Filter Package Containment Building Unit Materials

The pretreatment air filter package containment building will be constructed of steel-reinforced concrete. The interior floor and a portion of the walls will be lined with a protective coating. ~~The roof of the pretreatment plant will consist of metal roofing, roof insulation, and a vapor barrier. Run-on will be collected by roof drains and a drainage system with overflow drains.~~

Use of Incompatible Materials for the Pretreatment Air Filter Package Containment Building

~~A~~The protective coating ~~will be provided for the containment building. The coating~~ will be compatible with the wastes that will be managed in the unit, which will include spent HEPA and HEME filters. Activities in the unit will be limited to size reduction and waste packaging. Treatment reagents that could cause the protective coating to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the Pretreatment Air Filter Package Containment Building

The pretreatment air filter package containment building will be designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the Pretreatment Air Filter Package Containment Building

Prior to the start of operations, certification by a qualified~~,~~ registered professional engineer that the pretreatment air filter package containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because waste containing liquids will not be managed in the unit and waste will not be treated with liquids.

Operations of the Pretreatment Air Filter Package Containment Building

Operational and maintenance controls and practices will be established to ensure containment of the waste within the pretreatment air filter package containment building, as required by 40 CFR 264.1101(c)(1).

Maintenance of the Pretreatment Air Filter Package Containment Building

The protectively coated concrete floor and walls of the unit will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The protective coating will be compatible with materials that will be managed in the containment building, which will include spent HEPA and HEME filters. No decontamination chemicals that are incompatible with the coated concrete will be used.

Measures to Prevent Tracking Wastes from the Pretreatment Air Filter Package Containment Building

The pretreatment air filter package containment building is designed to manage spent HEPA and HEME filters. Conducting these activities in a C5 zone will prevent the spread of contaminated materials. Restricted personnel access and controlled movement of equipment into and out of the unit will decrease the possibility that waste will be tracked from the unit.

Personnel access to the pretreatment air filter package containment building, which is classified as a C5 contamination area, will be restricted ~~due to radiological concerns~~. Access to the unit will be allowed only under limited circumstances, thereby limiting the potential for contacting the waste and tracking it from the unit.

Procedures in the Event of Release or Potential for Release from the Pretreatment Air Filter Package Containment Building

Conditions that could lead to a release from the pretreatment air filter package containment building will be corrected as soon as possible after they are identified. In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods that will be used to satisfy this requirement will be developed prior to the start of operations.

Inspections of the Pretreatment Air Filter Package Containment Building

An inspection program will be established to detect conditions that could lead to a release of waste from the pretreatment air filter package containment building. The inspection and monitoring schedule and methods that will be used to detect releases from the unit are included in DWP Attachment 51, Chapter 6.

4.2.4.5 LAW LSM Gallery Containment Building (L-0112)

There will be ~~three~~ ~~five~~six containment buildings in the LAW vitrification plant. The first is the LAW locally shielded melter (LSM) gallery containment building, which will house the ~~three~~ two LAW ~~melters~~Melters. The LAW ~~m~~Melters are designed to include a roller or wheel assembly that will be used to move the melters in and out of the containment building. ~~Out-of-service~~Spent LAW ~~m~~Melters will be disconnected from the offgas system, feed lines, electrical lines, and instrumentation. Open ports will be sealed. The sealed exterior of the melter will be decontaminated, if needed, prior to removal from the containment building~~.~~ ~~Out-of-service melters will be transported out of the unit to melter storage area 1 or 2~~.

LAW LSM Gallery Containment Building Design

The LAW LSM gallery containment building will be completely enclosed within the LAW vitrification plant. The unit will be designed to prevent the release and exposure of dangerous constituents to the outside environment. The design and construction of the LAW vitrification plant exterior will prevent water from running into the plant. The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Rainwater run-off will be collected by roof drains and a drainage system with overflow drains. The approximate dimensions of the unit are summarized in Table 4-12.

The melter feed slurry will be introduced to the LAW melters through ~~single~~ double-walled stainless steel feed lines. The feed lines will also be provided with bulges that will function as secondary containment. A low point within the bulge will be incorporated into the design to allow drainage to a sump located in the adjacent process room.

The only other sources of liquids that will be present in the cave are the waterline to the two film cooler pipe washout spray rings, and the melter water jacket and connecting piping. These clean water lines will be instrumented to detect leaks automatically. A rupture of either water line or a waste feed line would be an abnormal event and the liquid would be contained within the outer melter shield box and corrective measures would be initiated. Corrective action would start with closure of the supply line and draining of remaining water outside the melter shield box, and could require feed cutoff and melter idling or shut down. The amount of water that could be released into the containment building would be unlikely to exceed a few gallons, which would rapidly evaporate into the ambient air due to the high temperature in the cave under normal operating conditions.

LAW LSM Gallery Containment Building Structure

The LAW LSM gallery containment building will be ~~a concrete-walled structure~~ fully enclosed within the LAW vitrification plant. Therefore, structural requirements for the containment building will be met by the design standards of the LAW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. ~~The seismic requirements for the LAW vitrification plant are presented in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, found in Supplement 1.~~ Within the containment building will be partitions between the LSMs. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the LAW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.

LAW LSM Gallery Containment Building Materials

The LAW LSM gallery containment building will be constructed of steel-reinforced concrete~~. The interior floor and the walls of the unit will be covered with a protective coating. The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Rainwater run-on will be collected by roof drains and a drainage system with overflow drains.~~

Use of Incompatible Materials for the LAW LSM Gallery Containment Building

~~A protective coating will be applied to the concrete floor and walls of the unit. The coating will be compatible with the wastes that will be managed in the containment building.~~ The wastes to be managed will include LAW LSM melters and consumables, which may be metallic parts and failed equipment. Very little or no glass waste is expected to be present on the exterior of the LSM, due to the design of the melter. Reagents that could cause the liner to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the LAW LSM Gallery Containment Building

The LAW LSM gallery containment building will be designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the LAW LSM Gallery Containment Building

Prior to the start of operations, certification by a qualified registered professional engineer that the LAW LSM gallery containment building meets the design requirements of 40 CFR 264.1101(a), (b), and (c) will be obtained.

Operation of the LAW LSM Gallery Containment Building

Operational and maintenance controls and practices will be established and followed to ensure containment of the waste within the LAW LSM gallery containment building, as required by 40 CFR 264.1101(c)(1). Activities in the building will be remotely_-conducted.

Maintenance of the LAW LSM Gallery Containment Building

~~The protectively-coated concrete floor of the containment building will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration.~~ The concrete ~~and protective coating~~ will be free of corrosion or other deterioration because it will be compatible with materials that will be managed in the containment building, including the glass waste and containerized or uncontainerized waste and equipment.

Measures to Prevent Tracking Wastes from the LAW LSM Gallery Containment Building

The unit is designed to manage LAW melters. The melters will be disconnected from systems when determined to be waste. The ports where the melter was attached to systems will be sealed and glass waste will be contained within the melter. This design will prevent waste from entering the containment building and thus from being tracked from the unit.

The unit will be classified as a C3 contamination area, which allows only limited personnel access~~Personnel access will be limited due to radiological concerns~~. Access will be required only for non-routine events such as when melters are determined to be waste, once every ~~four~~ 4 to ~~five~~ 5 years, or when equipment must be dismantled. ~~The unit will be classified as a C3 contamination area, which allows only limited personnel access.~~ Dry decontamination methods using cloth will be used.

~~Control of Fugitive Dust from the LAW LSM Gallery Containment Building~~

~~Operational controls and the LAW vitrification plant ventilation system will be used to control fugitive dust emissions from the unit to meet the requirements of 40 CFR 264.11101(c)(1)(iv).~~

~~The following measures will be used to prevent dust from escaping the LAW LSM gallery containment building:~~

- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Greater negative air pressure in the unit compared to adjacent C2 units, to pull air into the unit and prevent backflow~~
- ~~Intake air through controlled air in-bleed units, with backflow prevention dampers, and air gaps around shield doors sized to prevent backflow~~
- ~~Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~
- ~~A multiple fan extraction system, designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair~~
- ~~Personnel ingress and egress through airlocks and subchange rooms~~

Procedures in the Event of Release or Potential for Release from the LAW LSM Gallery Containment Building

Conditions that could lead to a release from the LAW LSM gallery containment building will be corrected as soon as possible after they are identified~~. The ventilation system and airlocks, the most likely sources of potential releases, are designed with two stages of HEPA filters, with backup HEPA filters to facilitate repairs and replacement~~.

In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods that will be used to satisfy this requirement will be developed prior to the start of operations. The methods will be followed to repair conditions that could lead to a release.

Inspections of the LAW LSM Gallery Containment Building

An inspection program will be established to detect conditions that could lead to release of wastes from the LAW LSM gallery containment building. The inspection and monitoring schedule and methods that will be used to detect releases from the unit are included in Chapter 6.

4.2.4.6 ILAW Container Finishing Line Containment Building (L-0109B, L-01/09C, L/-0109D, L-0109E, L/-0115B, L/-0115C, L-0/15D, L-01/165E/~~16A/16B~~)

The ILAW container finishing line containment building will be located in the LAW vitrification plant. It will be used for managing ILAW containers that have cooled sufficiently to be closed and prepared for finishing. Typical waste management activities performed in this containment building include storage of uncontainerized waste and decontamination. An ILAW container is transported from an inert filling ~~room to a~~and lidding room, to a decontamination room, and finally to a swab and monitor room, ~~to a fixative application room as necessary,~~ and then out of the containment building. This sequence of rooms is considered a finishing line. There are two finishing lines within the ILAW container finishing line containment building.

ILAW Container Finishing Containment Building Design

The ILAW container finishing containment building will be completely enclosed within the LAW vitrification plant. It will be designed to prevent the release and exposure of dangerous constituents to the outside environment. The design and construction of the LAW vitrification plant exterior will prevent water from running into the plant. The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Roof drains and drainage system with overflow drains will collect run-off. The approximate dimensions of the unit are summarized in Table 4-12.

ILAW Container Finishing Containment Building Structure

Because the ILAW container finishing containment building will be a concrete-walled structure fully enclosed within the LAW vitrification plant, its structural requirements will be met by the design standards of the LAW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the LAW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements for the LAW vitrification plant are presented in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, found in Supplement 1.~~

ILAW Container Finishing Containment Building Materials

The ILAW container finishing containment building will be constructed of steel-reinforced concrete. ~~The primary barrier of the inert filling rooms, lid sealing rooms, and swab and monitor rooms is the concrete structure of the unit. The interior floor and a portion of the walls of the decontamination rooms will be lined with a protective coating.~~

~~The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Roof drains and drainage system with overflow drains will collect run-on.~~

Use of Incompatible Materials for the ILAW Container Finishing Containment Building

~~The primary barrier will have a protective coating. This coating will be compatible with the waste managed in the unit.~~ The waste to be managed includes vitrified waste glass within the stainless steel containers~~. This coating will be present in the two inert fill rooms, the fixative application room, and the two swab and monitor rooms.~~

~~A protective coating will be present in the decontamination rooms. The coating will be compatible with the wastes that will be managed, which will include filled ILAW containers.~~ No glass waste is expected to be present on the exterior of the containers, due to the design of the melter pour stations. The interior is the only portion of the container that will be exposed to the glass waste. Additionally, the removal of glass will occur in the inert fill and lidding rooms. Carbon dioxide pellets, also compatible with the stainless steel, will be used to remove contamination from the container surface.

Reagents that could cause the liner to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the ILAW Container Finishing Containment Building

The ILAW containment building will be designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the ILAW Container Finishing Containment Building

Prior to start of operations, certification by a qualified registered professional engineer that the ILAW containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because the waste managed in the unit will not contain free liquids and free liquids will not be used to treat the waste.

Operation of the ILAW Container Finishing Containment Building

Operational and maintenance controls and practices will be established to ensure containment of the waste within the ILAW containment building, as required by 40 CFR 264.1101(c)(1). Activities in the building will be remotely conducted.

Maintenance of the ILAW Container Finishing Containment Building

~~The protectively-coated concrete floor and walls of the of the containment building will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration.~~ The ~~coated~~ concrete will be free of corrosion or other deterioration because it will be compatible with materials that will be managed in the containment building, which will include glass waste and containerized waste and equipment.

~~The protective coating in the decontamination rooms will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The coating will remain free of corrosion or other deterioration because it will be compatible with materials that will be managed in the containment building, which will include failed equipment.~~ Wastes managed in the containment building will not be stacked.

Measures to Prevent Tracking Wastes from the ILAW Container Finishing Containment Building

The ILAW containment building is designed to sample, seal, and decontaminate the filled ILAW containers. Conducting these activities in a C3 zone prevents the spread of contaminated materials from the unit as air flow is managed in the LAW vitrification plant ventilation system. The containment building is under negative pressure~~, so no air flow through doors or other openings occurs~~. Air flow through this containment building goes to a C5 air system, which passes through HEPA filters before exiting the plant stack.

A vacuum cleanup system, located in the two inert fill rooms, is expected to be infrequently used to collect dust from the inert filling activities, and thereby minimize the potential for dust to be tracked from the unit. The dust will be disposed of as secondary waste. Additionally, personnel access to the containment building, which is classified as a C3 contamination area, will be

~~limited due to radiological concerns. Access to the unit will be~~ allowed only under limited circumstances, reducing the potential for contacting the waste and tracking it from the unit.

~~Control of Fugitive Dust from the ILAW Container Finishing Containment Building~~

~~The following measures will be used to prevent fugitive dust from escaping the containment building:~~

- ~~A HEPA-filtered vacuum system will be dedicated to each decontamination room to collect debris~~
- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Greater negative air pressure in the unit, compared to adjacent C2 units, to pull air into the unit and prevent backflow~~
- ~~Intake air through controlled air in-bleed units, with backflow prevention dampers, and air gaps around shield doors sized to prevent backflow~~
- ~~Safety interlocks to shut down C3 extraction fans to prevent backflow if the C5 system shuts down~~
- ~~Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~
- ~~A multiple fan extraction system, designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair~~
- ~~Personnel ingress and egress through airlocks and subchange rooms~~

Procedures in the Event of Release or Potential for Release from the ILAW Container Finishing Containment Building

Conditions that could lead to a release from the ILAW containment building will be corrected as soon as possible after they are identified~~. The ventilation system and airlocks, the most likely sources of potential releases, will incorporate two stages of HEPA filters, with backup HEPA filters to facilitate repairs and replacement~~.

In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods to satisfy this requirement will be developed prior to the start of operations. The methods will be followed to repair conditions that could lead to a release.

Inspections of the ILAW Container Finishing Containment Building

An inspection program will be established to detect conditions that could lead to a release of wastes from the ILAW container finishing containment building. The inspection and monitoring schedule and methods that will be used to detect releases from the unit are included in Chapter 6.

4.2.4.7 LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building (L-0119B)

The LAW vitrification plant ~~C3 workshop~~consumable import/export containment building will be located in the ~~northwestern portion~~west end of the LAW vitrification plant on the +3 ft elevation. Typical waste management activities performed in this containment building include~~,~~ decontamination, size reduction, and packaging of spent equipment. Simple decontamination of components will be performed to allow contact handling. Waste streams generated within the workshop will be volume reduced as necessary by means of disassembly or other suitable means to fit standard packaging such as drums and/or small boxes.

LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building Design
The LAW vitrification plant ~~C3 workshop~~consumable import/export containment building will be designed as a completely enclosed area within the LAW vitrification plant. It is designed to prevent the release of dangerous constituents and their exposure to the outside environment. The design and construction of the LAW vitrification plant exterior will prevent water from running into the plant. The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and vapor barrier. Rainwater run-off will be collected by roof drains and drainage systems with overflow roof drains. The approximate dimensions of the unit are summarized in Table 4-12.

LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building Structure
The LAW vitrification plant ~~C3 workshop~~consumable import/export containment building will be a concrete-walled structure fully enclosed within the LAW vitrification plant. Therefore, structural requirements for the containment building will be met by the design standards of the LAW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the LAW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements for the LAW vitrification plant are presented in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, as found~~~~located~~ ~~in Attachment 51, Chapter 4, Supplement 1.~~

LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building Materials
The LAW vitrification plant ~~C3 workshop~~consumable import/export containment building will be constructed of steel-reinforced concrete. ~~The interior floor and a portion of the walls of the unit will be lined with a protective coating. The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and vapor barrier. Rainwater run-off will be collected by roof drains and drainage systems with overflow roof drains.~~

Use of Incompatible Materials in the LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building
~~A protective coating will be provided for the floor of this unit. The protective coating will be compatible with the wastes that will be managed.~~ Activities in the unit will be limited to decontamination, size reduction, and packaging the waste components into drums or waste

boxes. Treatment reagents that could cause the liner or coating to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/ Export Containment Building

The LAW vitrification plant ~~C3 workshop~~consumable import/export containment building will be designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building

Prior to startup of operations, a certification by a qualified registered professional engineer that the LAW vitrification plant ~~C3 workshop~~consumable import/export containment building meets the design requirements of 40 CFR 264.1101(a), (b), and (c) will be obtained.

Operation of the LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building

Operational and maintenance controls and practices will be established and followed to ensure containment of the wastes within the LAW vitrification plant C3 containment building unit as required by 40 CFR 264.1101(c)(1).

Maintenance of the LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building

~~The protective coating of the unit will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The protective coating will remain free of corrosion or other deterioration because it is compatible with materials that will be managed in the containment building.~~ The failed equipment that will be managed in the containment building unit will be compatible with ~~stainless steel or the protective coating. Only decontamination chemicals that are compatible with the liner or coating will be used~~the concrete structure.

Measures to Prevent Tracking Wastes from the LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building

The LAW vitrification plant ~~C3 workshop~~consumable import/export containment building will be designed to isolate failed equipment from the accessible environment and to prevent the spread of contaminated materials. Very little dust is expected to be generated in the unit.

~~Personnel access to t~~The containment building will be ~~limited due to radiological concerns. It will be~~ classified as a C3 contamination area, which allows only limited access by personnel. Wastes leaving the unit will be enclosed within containers. If necessary, these containers will be decontaminated in the unit ~~and subjected to radiological survey~~ prior to release and transportation to ~~another~~ permitted storage area. Equipment leaving the unit will be decontaminated, when necessary, before being released for removal from the cells.

~~Control of Fugitive Dust from the LAW Vitrification Plant C3 Workshop Containment Building~~
~~The following measures will be used to prevent fugitive dust from escaping the LAW vitrification plant C3 workshop containment building:~~

- ~~A cascading air flow from areas of least to greatest potential contamination (that is, C2 to C3 to C5)~~
- ~~Intake air through controlled air in-bleed units, with backflow prevention dampers, and air gaps around shield doors sized to prevent backflow~~
- ~~HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~
- ~~A multiple fan extraction system designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair~~

Procedures in the Event of Release or Potential for Release from the LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building
The design and operation of the unit makes it very unlikely that releases will occur. The design and operational measures will minimize the generation of dust and contain it within the unit. The ventilation system will also use negative air pressure to keep contamination from spreading to areas of lesser contamination~~, and will use two-stage HEPA filtration to reduce the release of particles. The ventilation system is designed with backup HEPA filters to provide redundant controls and to facilitate repairs or replacement~~.

Inspections will identify conditions that could lead to a release. Such conditions will be corrected as soon as possible after they are identified. In the unlikely event that a release of dangerous wastes from the containment building is detected, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods that will be used to satisfy this requirement will be developed prior to the start of operations. These methods will be followed to repair conditions that could lead to a release.

Inspections of the LAW Vitrification Plant ~~C3 Workshop~~Consumable Import/Export Containment Building
An inspection program will be established to detect conditions that could lead to a release of wastes from the LAW vitrification plant ~~C3 workshop~~consumable import/export containment building. The inspection and monitoring schedule and methods that will be used to detect releases from the unit ~~is~~ are included in Chapter 6.

4.2.4.8 C3 Workshop Containment Building (L-226A)

The C3 workshop containment building will be located in the west side of the LAW vitrification plant at elevation +28 feet.

Typical waste management activities performed in this containment building include decontamination, size reduction, and packaging of spent equipment. Equipment will be transported to the unit contained in shielded casks, drums, or in a standard waste box. In the workshop, the equipment will be decontaminated to enable "hands–on" maintenance. Spent equipment parts will be bagged and placed in standard waste containers or boxes for disposal. Size reduction may be performed to facilitate packaging. Other spent equipment will be packaged in drums or standard waste boxes.

C3 Workshop Containment Building Design

The C3 workshop containment building will be a completely enclosed area within the LAW vitrification plant. It will be designed to prevent the release of dangerous waste and their exposure to the outside environment. The design and construction of the LAW vitrification plant exterior will prevent water from running into the plant. The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and vapor barrier. Rainwater run-off will be collected by roof drains and drainage systems with overflow roof drains. The approximate dimensions of the unit are summarized in Table 4-12.

C3 Workshop Containment Building Structure

The C3 workshop containment building will be fully enclosed within the LAW vitrification plant. Therefore, structural requirements for the containment building will be met by the design standards of the LAW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the LAW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements for the LAW vitrification plant are presented in *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, found in Supplement 1.~~

C3 Workshop Containment Building Materials

The C3 workshop containment building will be constructed of a steel-reinforced concrete floor and plasterboard partition walls.~~The primary barrier of the pour cave is the concrete structure of the unit. The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and vapor barrier. Rainwater run-off will be collected by roof drains and drainage systems with overflow roof drains.~~

Use of Incompatible Materials in the C3 Workshop Containment Building

Activities in the unit will be limited to decontamination, size reduction, and packaging the waste components into drums or waste boxes. Treatment reagents that could cause the liner or coating to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the C3 Workshop Containment Building

The C3 workshop containment building is designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the C3 Workshop Containment Building

Prior to startup of operations, a certification by a qualified registered professional engineer that the C3 workshop containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because the waste managed in the unit will not contain free liquids or be treated with free liquids.

Operation of the C3 Workshop Containment Building

Operational and maintenance controls and practices will be established and followed to ensure containment of the wastes within the C3 workshop containment building unit as required by 40 CFR 264.1101(c)(1).

Maintenance of the C3 Workshop Containment Building

The concrete will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The concrete will remain free of corrosion or other deterioration because it is compatible with materials that will be managed in the containment building. The failed equipment that will be managed in the containment building unit will be compatible with the concrete. Only decontamination chemicals that are compatible with the concrete will be used.

Measures to Prevent Tracking Wastes from the C3 Workshop Containment Building

The C3 workshop containment building will be designed to isolate failed equipment from the accessible environment and to prevent the spread of contaminated materials. Very little dust is expected to be generated in the unit.

~~Personnel access to t~~The containment building ~~will be limited due to radiological concerns. It will be~~ classified as a C3 contamination area, which allows only limited access by personnel. Personnel access will be via a C2/C3 subchange room. Equipment will enter and exit the workshop via a C2/C3 airlock. Wastes leaving the unit will be enclosed within containers. If necessary, the containers will be decontaminated in the unit prior to transportation to a permitted storage area. Equipment leaving the unit will be decontaminated, when necessary, before being released for removal from the cells.

Procedures in the Event of Release or Potential for Release from the C3 Workshop Containment Building

The design and operation of the unit makes it very unlikely that releases will occur. The design and operational measures will minimize the generation of dust and contain it within the unit. The ventilation system will also use negative air pressure to keep contamination from areas of lesser contamination. Offgas will be routed to the LAW offgas treatment system.

Inspections will identify conditions that could lead to a release. Such conditions will be corrected as soon as possible after they are identified. In the unlikely event that a release of dangerous wastes from the containment building is detected, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods that will be used to satisfy this requirement will be developed prior to the start of operations. These methods will be followed to repair conditions that could lead to a release.

Inspections of the C3 Workshop Containment Building

An inspection program will be established to detect conditions that could lead to a release of wastes from the C3 workshop containment building. The inspection and monitoring schedule and methods that will be used to detect releases from the unit ~~is~~are included in Chapter 6.

4.2.4.9 LAW Pour Cave Containment Building (L-B009B, L-B011B, L-B011C, L-B013B, L-B013C, L-B0~~1~~15A)

The LAW pour cave containment building (rooms L-B009B, L-B011B, L-B011C, L-B013B, L-B013C, L-B0~~1~~15A) will be located in the LAW vitrification plant, elevation -21 ft. It will be used for managing ILAW containers as they are filled with glass from the LAW ~~m~~Melters (LAW-MLTR-00001/2). The filled ILAW containers will be allowed to cool with the lids off the container. Cooled ILAW containers will be transferred to the ILAW container finishing line containment building for lidding and preparation for export to a storage facility.

LAW Pour Cave Containment Building Design

The LAW pour cave containment building will be completely enclosed within the LAW vitrification plant, which will be designed to prevent the release and exposure of dangerous constituents to the outside environment. The design and construction of the LAW vitrification plant exterior will prevent precipitation from entering into the plant. The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Roof drains and drainage system with overflow drains will collect run-off. The approximate dimensions of the unit are summarized in Table 4-12.

LAW Pour Cave Containment Building Structure

Because the LAW pour cave containment building will be a concrete-walled structure fully enclosed within the LAW vitrification plant, its structural requirements will be met by the design standards of the LAW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the LAW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements for the LAW vitrification plant are presented in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, found in Supplement 1.~~

LAW Pour Cave Containment Building Materials

The LAW pour cave containment building will be constructed of steel-reinforced concrete.~~ The primary barrier of the pour caves is the concrete structure of the unit. The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Roof drains and drainage system with overflow drains will collect run-off.~~

Use of Incompatible Materials for the LAW Pour Cave Containment Building

The waste to be managed includes vitrified waste glass within the stainless steel containers. No glass waste is expected to be present on the exterior of the containers, due to the design of the melter pour stations. The interior is the only portion of the container that will be exposed to the glass waste. Reagents that could cause corrosion or other failure will not be used within the unit.

Primary Barrier Integrity in the LAW Pour Cave Containment Building

The LAW pour cave containment building will be designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~the~~ *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the LAW Pour Cave Containment Building

Prior to start of operations, certification by a qualified registered professional engineer that the LAW pour cave containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because the waste managed in the unit will not contain free liquids and free liquids will not be used to treat the waste.

Operation of the LAW Pour Cave Containment Building

Operational and maintenance controls and practices will be established to ensure containment of the waste within the LAW pour cave containment building, as required by 40 CFR 264.1101(c)(1). Activities in the building will be remotely conducted during normal operation when ILAW containers are present.

Maintenance of the LAW Pour Cave Containment Building

The concrete will be free of corrosion or other deterioration because it will be compatible with materials that will be managed in the containment building, which will include containerized glass waste and equipment. Wastes managed in the containment building will not be stacked.

Measures to Prevent Tracking Wastes from the LAW Pour Cave Containment Building

The LAW pour cave containment building is designed to manage the filling and movement of ILAW containers. Conducting these activities in a C5 zone prevents the spread of contaminated materials from the unit as airflow is managed in the LAW vitrification plant ventilation system. The containment building is under negative pressure. Airflow through this containment building goes to a C5 air system, which passes through HEPA filters before exiting the plant stack. Personnel access will be restricted during normal operation since it is classified as a C5 contamination area. The containment building may be reclassified as a C3 area for equipment maintenance.

Procedures in the Event of Release or Potential for Release from the LAW Pour Cave Containment Building

Conditions that could lead to a release from the LAW pour cave containment building will be corrected as soon as possible after they are identified. In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods to satisfy this requirement will be developed prior to the start of operations. The methods will be developed to repair conditions that could lead to a release.

Inspections of the LAW Pour Cave Containment Building

An inspection program will be established to detect conditions that could lead to a release of wastes from the LAW pour cave containment building. The inspection and monitoring schedule and methods that will be used to detect releases from the unit are included in Chapter 6.

4.2.4.10 LAW Container Buffer Storage Containment Building (L-B025C, L-B025D)

The LAW container buffer storage containment building (rooms L-B025C, L-B0025D) will be located in the LAW vitrification plant, elevation -21 ft. It will be used for managing ILAW containers as after they are filled with glass from the LAW Melters (LAW-MLTR-00001/2). The filled ILAW containers will be allowed to cool with the lids off the container. Cooled ILAW containers will be transferred to the ILAW container finishing line containment building for lidding and preparation for export to a storage facility.

LAW Container Buffer Storage Containment Building Design

The LAW container buffer storage containment building will be completely enclosed within the LAW vitrification plant, which will be designed to prevent the release and exposure of dangerous constituents to the outside environment. The design and construction of the LAW vitrification plant exterior will prevent precipitation from entering into the plant. The roof of the LAW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Roof drains and drainage system with overflow drains will collect run-off. The approximate dimensions of the unit are summarized in Table 4-12.

LAW Container Buffer Storage Containment Building Structure

Because the LAW container buffer storage containment building will be a concrete-walled structure fully enclosed within the LAW vitrification plant, its structural requirements will be met by the design standards of the LAW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the LAW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.

LAW Container Buffer Storage Containment Building Materials

The LAW container buffer storage containment building will be constructed of steel-reinforced concrete.

Use of Incompatible Materials for the LAW Container Buffer Storage Containment Building

The waste to be managed includes vitrified waste glass within the stainless steel containers. No glass waste is expected to be present on the exterior of the containers. The interior is the only portion of the container that will be exposed to the glass waste. Reagents that could cause corrosion or other failure will not be used within the unit.

Primary Barrier Integrity in the LAW Container Buffer Storage Containment Building

The LAW container buffer storage containment building will be designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*,

~~Supplement 1~~DWP Attachment 51, Supplement 1 ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the LAW Container Buffer Storage Containment Building

Prior to start of operations, certification by a qualified registered professional engineer that the LAW container buffer storage containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because the waste managed in the unit will not contain free liquids and free liquids will not be used to treat the waste.

Operation of the LAW Container Buffer Storage Containment Building

Operational and maintenance controls and practices will be established to ensure containment of the waste within the LAW container buffer storage containment building, as required by 40 CFR 264.1101(c)(1). Activities in the building will be remotely conducted during normal operation when ILAW containers are present.

Maintenance of the LAW Container Buffer Storage Containment Building

The concrete will be free of corrosion or other deterioration because it will be compatible with materials that will be managed in the containment building, which will include containerized glass waste and equipment. Wastes managed in the containment building will not be stacked.

Measures to Prevent Tracking Wastes from the LAW Container Buffer Storage Containment Building

The LAW container buffer storage containment building is designed to manage the movement and storage of ILAW containers. Conducting these activities in a C5 zone prevents the spread of contaminated materials from the unit as airflow is managed in the LAW vitrification plant ventilation system. The containment building is under negative pressure. Airflow through this containment building goes to a C5 air system, which passes through HEPA filters before exiting the plant stack. Personnel access will be restricted during normal operation since it is classified as a C5 contamination area. The containment building may be reclassified as a C3 area for equipment maintenance.

Procedures in the Event of Release or Potential for Release from the LAW Container Buffer Storage Containment Building

Conditions that could lead to a release from the LAW container buffer storage containment building will be corrected as soon as possible after they are identified. In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods to satisfy this requirement will be developed prior to the start of operations. The methods will be developed to repair conditions that could lead to a release.

Inspections of the LAW Container Buffer Storage Containment Building

An inspection program will be established to detect conditions that could lead to a release of wastes from the LAW container buffer storage containment building. The inspection and monitoring schedule and methods that will be used to detect releases from the unit are included in Chapter 6.

~~4.2.4.10~~4.2.4.11 HLW Melter Cave No. 1 Containment Building (H-0117, H-0116B, H-0310A) and HLW Melter Cave No. 2 Containment Buildings ~~(H-0117, H-0116B, H-0310A and~~ (H-0106, H-0105B, H-0304A)

~~There are six containment buildings located within the HLW vitrification plant.~~ The HLW melter cave no. 1 and HLW melter cave no. 2 containment buildings are located in the central portion of the HLW vitrification plant. The each of the containment buildings will ~~be comprised of~~house an ~~the~~ HLW melter caves, ~~and the~~an overpack C3/C5 airlocks, and ~~the~~an equipment decontamination area.

Typical waste management activities performed in these containment buildings include~~,~~ the dismantling and packaging of spent consumables~~,~~ and decontamination of equipment for hands-on maintenance. The types of spent consumables will include waste recirculators, lid heaters, bubblers, ~~and~~ thermocouples, and jumpers. When spent consumables are ready for change-_out, they will be placed on a consumable storage rack while awaiting size reduction. The consumables will be reduced in size by dismantling or cutting the spent equipment, or both. This process will be remotely-_conducted on tables in the containment building. The spent consumables will be placed in baskets and lowered into containers in a transfer tunnel that passes under the HLW melter cave no. 1 and 2 containment buildings (H--0117, H-0116B, H-0310A and H--0106, H-0105B, H-0304A). The C3/C5 airlocks ~~cells~~ will be used for packing or unpacking melters or their components.

In case of a HLW melter failure, the melter will be evaluated for meeting the receiving TSD waste acceptance criteria, particularly in terms of the radiological contamination in the HLW glass residue present in the melter, before it is placed in an overpack.

The equipment decontamination area located within the melter cave containment building will house the ~~d~~Decontamination ~~t~~Tanks (HSH-TK-00001/2) where equipment removed from the melter cave will be decontaminated prior to maintenance. The equipment will be initially decontaminated by soaking in the decontamination tank. After evaluation, additional decontamination may be performed using manipulators before the levels are acceptable for hands-on maintenance.

Located within the melter caves containment building will be the HLW melter; the submerged bed scrubber and HEMEs, which will function as part of the melter offgas system~~;~~, the ~~f~~Feed ~~preparation~~ Preparation ~~tank~~ Vessels (HFP-VSL-00001/5),~~;~~ and the HLW Melter F~~f~~eed ~~tank~~ Vessels (HFP-VSL-00002/6). These tank systems will have ~~primary and~~ secondary containment~~,~~ and are addressed ~~s~~Section 4.2.2. ~~Therefore, there is no need for secondary containment within the containment building, as the tank systems meet the requirements~~ of ~~WAC 173-303-640.~~

HLW Melter Cave No. 1 and HLW Melter Cave No. 2 Containment Building Design

The two HLW melter containment buildings are completely enclosed within the HLW vitrification plant. Each ~~unit~~ of the melter cave containment buildings will ~~comprise the~~house an HLW melter cave, ~~and the~~an overpack C3/C5 airlock cell, and an equipment decontamination area. ~~Each~~ Both melter cave containment buildings ~~unit is~~are designed to prevent the release of dangerous constituents and exposure to the outside environment. The design and construction of the HLW vitrification plant exterior will prevent water from running into the plant. The roof of the HLW vitrification plant will be metal. Run-off will be collected by roof drains and a drainage system with overflow roof drains.

~~The only other sources of liquids that will be present in the caves is the water line to the two film cooler pipe washout spray rings, and the melter water jacket and connecting piping. These clean water lines will be instrumented to detect leaks automatically. A rupture of either water line would be an abnormal event and would require corrective measures. Corrective action would start with closure of the supply line and draining of remaining water outside the caves, and could require feed cutoff and melter idling or shut down. The amount of water that could be released in the containment building would be unlikely to exceed a few gallons, which would rapidly evaporate into the ambient air due to the high temperature in the caves under normal operating conditions.~~

The containment building design requirements of 40 CFR 264.1101(b) do not apply because the liquid dangerous wastes managed in the HLW melter containment building are addressed under tank systems (see ~~S~~section 4.2.2).

HLW Melter Cave No. 1 and HLW Melter Cave No. 2 Containment Building Structure

The HLW melter cave no. 1 and 2 containment buildings will be a fully enclosed, concrete-walled structure within the HLW vitrification plant. Therefore, its structural requirements will be met by the design standards of the HLW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the HLW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements for the HLW vitrification plant are found in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, found in Supplement 1.~~

HLW Melter Cave No. 1 and HLW Melter Cave No. 2 Containment Building Materials

The HLW melter cave no. 1 and 2 containment buildings will be constructed of steel-reinforced concrete. The interior floor and a portion of the walls of the unit will be lined with stainless steel, except for the C3/C5 airlock. The height of the lining is summarized in Table 4-11.

~~The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Run-off will be collected by roof drains and a drainage system with overflow roof drains.~~

Use of Incompatible Materials for the HLW Melter Cave No. 1 and HLW Melter Cave No. 2 Containment Buildings

A partial stainless steel liner will be provided for the containment buildings, except for the C3/C5 airlock. The C3/C5 airlock will be partially lined with a protective coating. The stainless steel will be compatible with the wastes that will be managed, which will include ~~failed~~ spent melters and consumables, including air spargers, metallic parts, and refractory bricks. Treatment reagents that could cause the liner to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the HLW Cave No. Melter 1 and HLW Melter Cave No. 2 Containment Buildings

The HLW melter cave no. 1 and 2 containment buildings are designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the HLW Cave No. Melter 1 and HLW Melter Cave No. 2 Containment Buildings

Prior to the start of operations, certification by a qualified registered professional engineer that the HLW melter containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because liquid dangerous wastes present in the containment building will be managed in tank systems with secondary containment systems, as presented in ~~S~~section 4.2.2.

Operation of the HLW Melter Cave No. 1 and HLW Melter Cave No. 2 Containment Buildings

Operational and maintenance controls and practices will be established and followed to ensure containment of the wastes within the HLW melter containment building, as required by 40 CFR 264.1101(c)(1).

Maintenance of the HLW Melter Cave No. 1 and HLW Melter Cave No. 2 Containment Buildings

The partial stainless steel lining of the containment building will be designed and constructed ~~and maintained~~ in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The liner will be welded at each seam. The stainless steel liner will be free of corrosion or other deterioration because it will be compatible with materials that will be managed in the containment building, which will include ~~failed~~ spent melters and spent equipment. Only decontamination chemicals that are compatible with the liner will be used.

Wastes managed in the containment building will not be stacked. In general, waste will be placed in containers and removed from the containment building.

Measures to Prevent Tracking Wastes from the HLW Melter Cave No. 1 and HLW Melter Cave No. 2 Containment Building

The HLW melter cave no. 1 and 2 containment building design and operating methods include several measures that will prevent wastes from being tracked from the unit. Measures that will be implemented include:

- Limiting the movement of personnel and material from the unit
- Using ~~interlocked~~ shield doors to prevent the inadvertent spread of contamination
- Decontaminat~~ion of~~ing materials or containers before they are released from the unit
- Using C5 ventilation ~~used~~ as a primary containment method

Personnel access to the HLW melter caves, which are classified as a C5 contamination area, will be restricted ~~due to radiological concerns~~. Personnel operating in melter cave C3/C5 airlocks will not be in contact with ~~failed~~ spent melters because they will be encased in overpack containers.

Export of equipment from the melter caves will be kept to a minimum by performing in-cave maintenance to the maximum extent possible. The design of the cave and equipment includes master-slave manipulators, special tools, and a tool import port that will enable maintenance operations to be conducted remotely without removing the equipment from the cave. When equipment must be removed for hands-on maintenance, it will be transferred through shield doors into the ~~d~~Decontamination ~~t~~Tank (HSH-TK-00001/2) or the crane decontamination area (C3/C5) above the C3/C5 airlock. ~~The C3/C5 doors will be interlocked with shield doors to the adjacent maintenance room, to prevent radiological shine and the spread of contamination.~~ The equipment will be transferred to the maintenance room only after it has been decontaminated in ~~d~~Decontamination ~~t~~Tank HSH-TK-00001/2, and in the equipment decontamination area, if needed.

Spent consumables and wastes will be size-reduced in the cave and exported to drums through an air lock, which is designed to provide containment of contamination between the C5 melter cave and the C3 drum transfer tunnel. Export of ~~failed~~ spent ~~melters~~ Melters will be controlled to prevent the spread of contamination. Melters will be transferred into overpack containers that are docked with the shield doors to the C3/C5 airlock.

~~Control of Fugitive Dust from the HLW Melter 1 and 2 Containment Buildings~~

~~Operational controls and the HLW vitrification plant ventilation system will be used to control fugitive dust emissions from the unit to meet the requirements of 40 CFR 264.11101(c)(1)(iv). The following measures will be used to prevent dust from escaping the HLW melter 1 and 2 containment buildings:~~

- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Greater negative air pressure in the unit, compared with adjacent C3 units, to pull air into the unit and prevent backflow~~

~~□Intake air through controlled air in-bleed units, with backflow prevention dampers~~

~~□Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~

~~□A multiple fan extraction system, designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair~~

~~□Personnel ingress and egress through airlocks and subchange rooms~~

Procedures in the Event of Release or Potential for Release from the HLW Melter Cave No. 1 and HLW Melter Cave No. 2 Containment Buildings

Conditions that could lead to a release from the HLW melter cave no. 1 and HLW melter cave no. 2 containment buildings will be corrected as soon as possible after they are identified~~. The ventilation system and airlocks, the most likely sources of potential releases, are designed with backup HEPA filters to facilitate repairs and replacement~~.

In the unlikely event of a release of dangerous wastes from either containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods to satisfy this requirement will be developed prior to the start of operations.

Inspections of the HLW Melter Cave No. 1 and HLW Melter Cave No. 2 Containment Buildings

An inspection program will be established~~,~~ as required under WAC 173-303-695~~,~~ to detect conditions that could lead to the release of wastes from the HLW melter cave no. 1 and HLW melter cave no. 2 containment buildings. The inspection and monitoring schedule and methods that will be used to detect a release from the unit are included in Chapter 6.

~~4.2.4.8~~4.2.4.12 IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building (H-0136)

The HLW ~~IHLW container weld~~canister handling cave containment building will be located in the southern portion of the HLW vitrification plant. Typical waste management activities performed within this containment building include the storage of uncontainerized waste. Located within the containment building will be two cooling and buffer storage areas and two container welding and rework stations. IHLW ~~containers~~canisters ~~, which~~that have cooled enough to leave the ~~miscellaneous unit~~ pour areas~~,~~ will be transported to the ~~IHLW container weld~~canister handling cave containment building by means of an overhead crane. The IHLW glass waste will continue to cool in the buffer storage areas. When adequately cooled, ~~containers~~ canisters will be moved to one of the two weld and rework cells, where the temporary lid that had been placed on the ~~container~~ canister will be removed and the permanent lid will be welded onto the ~~container~~canister. The IHLW container will then be transported to the IHLW ~~IHLW container~~ canister ~~decontamination~~swabbing and monitoring cave containment building. Container management practices are discussed in ~~S~~section 4.2.1.

IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building Design

The IHLW ~~container weld~~canister handling cave containment building will be completely enclosed within the HLW vitrification plant. The design and construction of the HLW vitrification plant exterior will prevent water from running into the plant. The roof of the HLW vitrification plant will be metal. Run-off will be collected by roof drains and a drainage system with overflow roof drains. The unit is designed to prevent the release and exposure of dangerous constituents to the outside environment. Its approximate dimensions are summarized in Table 4-12.

IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building Structure

Because the IHLW ~~container weld~~canister handling cave containment building will be a concrete-walled structure fully enclosed within the HLW vitrification plant, its structural requirements will be met by the design standards of the HLW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the HLW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements for the structure are addressed in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, found in Supplement 1.~~

IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building Unit Materials

The IHLW ~~container weld~~canister handling cave containment building will be constructed of steel-reinforced concrete. The interior floor and a portion of the walls of the unit will be lined with stainless steel. The height of the lining will be determined as design progresses. ~~The roof of the HLW vitrification plant will be metal. Run-off will be collected by roof drains and a drainage system with overflow roof drains.~~

Use of Incompatible Materials for the IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building

~~A~~ The partial stainless steel liner will be provided for the IHLW containment building ~~which~~ that will be compatible with the ~~IHLW~~ steel ~~containers~~ canisters that will be managed. Treatment reagents that could cause the liner to leak, corrode, or otherwise fail will not be used in the unit.

Primary Barrier Integrity in the IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building

The HLW vitrification plant is designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building

Prior to the start of operations, certification by a qualified registered professional engineer that the IHLW ~~container weld~~canister handling cave containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because waste containing free liquid ~~wastes~~ will not be managed in the containment building and the waste will not be treated with free liquids.

Operation of the IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building
Operational and maintenance controls and practices will be established to ensure containment of the wastes within the IHLW ~~container weld~~canister handling cave containment building, as required by 40 CFR 264.1101(c)(1).

Maintenance of the IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building
The partial stainless steel lining of the containment building will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The stainless steel liner will be welded at each seam, and will be free of corrosion or other deterioration because it will be compatible with materials that will be managed in the containment building, including the stainless steel containers. Only decontamination chemicals that are compatible with the liner will be used.

Wastes that will be managed in the containment building will not be stacked higher than the unit wall~~,~~; however, wastes are not anticipated to be stacked.

Measures to Prevent Tracking Wastes from the IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building
The IHLW ~~IHLW container weld~~canister handling cave containment building is designed to store cooling IHLW glass waste containers and weld the lids onto the containers.

The outside of the ~~container~~ canister will be inspected to see whether glass is present on the container. If glass is found, it will be removed using a needle gun or other mechanical method. The glass shards will be collected for disposal in a shop-type vacuum and disposed of as a secondary waste. The containment building will be classified as a C5 contamination area, and therefore personnel access will be ~~limited~~ restricted ~~due to radiological concerns~~. Wastes leaving the unit will be within containers.

~~Control of Fugitive Dust from the IHLW Container Weld Containment Building~~
~~Operational controls and the HLW vitrification plant ventilation system will be used to control fugitive dust emissions from the unit to meet the requirements of 40 CFR 264.11101(c)(1)(iv). The following measures will be used to prevent dust from escaping the IHLW container weld containment building:~~

- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Greater negative air pressure in the unit compared with adjacent C3 units, to pull air into the unit and prevent backflow~~
- ~~Intake air through controlled air in-bleed units, with backflow prevention dampers~~
- ~~Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~
- ~~A multiple fan extraction system, designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair~~
- ~~Personnel ingress and egress through airlocks and subchange rooms~~

Procedures in the Event of Release or Potential for Release from the IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building

Conditions that could lead to a release from the IHLW ~~IHLW container weld~~canister handling cave containment building will be corrected as soon as possible after they are identified. ~~The ventilation system, as the most likely source of potential releases, is designed with backup HEPA filters to facilitate repairs and replacement.~~

In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods to satisfy this requirement will be developed prior to the start of operations.

Inspections of the IHLW ~~IHLW Container Weld~~Canister Handling Cave Containment Building

An inspection program will be established as required under WAC 173-303-695 to detect conditions that could lead to the release of wastes from the IHLW ~~container weld~~canister handling cave containment building. The inspection and monitoring schedule and methods that will be used to detect a release from the unit are included in Chapter 6.

~~4.2.4.9~~4.2.4.13 IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building (H-0133)

The IHLW ~~IHLW container~~ canister ~~decontamination~~swab and monitoring cave containment building ~~will be~~is located in the southeast ~~corner~~ portion of the HLW vitrification plant (~~Rm~~room H-0133). ~~Typical waste management activities performed in this containment building include decontamination of the exterior of the filled IHLW containers.~~ The systems associated with the swabbing and monitoring activities in the cave include overhead crane, grapples, power manipulator, swabbing turntable, and swabbing waste storage container.

~~IHLW containers, which have permanent lids, will be received at the unit. The containers will be washed in a tank with de-ionized water to remove loose contamination that may be on the surface of the container. The container will then be washed with ceric nitrate and nitric acid to remove a layer of steel as part of the decontamination process. The tank will be drained and the container will then be sprayed with nitric acid. Additional nitric acid rinses may be conducted, if needed. A deionized water spray will then be performed. Tank activities will occur in permitted tank systems which have secondary containment, as addressed in Section 4.2.2.~~

After ~~the~~ decontaminat~~ed container~~ioned in the ~~canister decon vessel~~Decontamination Tanks (HSH-TK-0001/2), the canister is ~~has dried it will be transferred~~moved to the canister swabb~~ing station, where its exterior will be swabbed, and the swabs monitored for gamma radiation. When the container is found to meet surface radiological requirements, it will be transferred to the IHLW container storage area~~and monitoring building and placed on the turntable. The turntable provides a base on which the canister is set and rotated while the surface swabbing is performed. When surface cleanliness has been verified, the canister is placed in the canister storage bogie and transferred to the canister storage cave.

IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building Design

The IHLWe ~~IHLW container~~ canister ~~decontamination~~swab and monitoring cave containment building will be completely enclosed within the HLW vitrification plant, and will be designed to prevent the release of dangerous constituents and their exposure to the outside environment. The design and construction of the HLW vitrification plant exterior will prevent water from running into the plant. The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Run-off will be collected by roof drains and a drainage system with overflow roof drains. Unit dimensions are summarized in Table 4-12.

The containment building design requirements of 40 CFR 264.1101(b) do not apply because there are no liquid wastes managed in the IHLW ~~IHLW container~~ canister ~~decontamination~~swab and monitoring cave containment building ~~are addressed under tank systems in Section 4.2.2.~~

IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building Structure

Because the IHLW ~~IHLW container~~ canister ~~decontamination~~swab and monitoring cave building will be a concrete-walled structure fully enclosed within the HLW vitrification plant, its structural requirements will be met by the design standards of the HLW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the HLW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements that the building must address are presented in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, found in Supplement 1.~~

IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building Unit Materials

The IHLW ~~IHLW container~~ canister ~~decontamination~~swab and monitoring cave containment building will be constructed of steel-reinforced concrete. The interior floor and a portion of the walls of the unit will be ~~lined~~ covered with ~~stainless steel~~protective coating. ~~The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Run-off will be collected by roof drains and a drainage system with overflow roof drains.~~

Use of Incompatible Materials for the IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building

~~A stainless steel liner will be provided for the containment building and will be compatible with the IHLW containerized wastes that will be managed.~~ Treatment reagents that could cause the ~~liner~~ protective coating to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building

The IHLW ~~IHLW container~~ canister ~~decontamination~~swab and monitoring cave building is designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building

Prior to the start of operations, certification by a qualified registered professional engineer that the IHLW ~~container~~ canister ~~decontamination~~swab and monitoring cave containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because there are no free liquids managed in the unit ~~are addressed under tank systems in Section 4.2.2~~.

Operation of the IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building

Operational and maintenance controls and practices will be established to ensure containment of the wastes within the IHLW ~~IHLW container~~ canister ~~decontamination~~swab and monitoring cave containment building, as required by 40 CFR 264.1101(c)(1).

Maintenance of the IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building

The ~~stainless steel lining~~protective coating of the containment building will be ~~constructed and~~ maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration~~. The stainless steel liner will be welded at each seam, and will be free of corrosion or other deterioration because it will be compatible with materials that will be managed in the containment building, as well as the stainless steel containers that will be managed~~. Only decontamination chemicals that are compatible with the liner will be used. Wastes are not expected to be stacked within the unit.

Measures to Prevent Tracking Wastes from the IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building

The IHLW ~~IHLW decontamination~~canister swab and monitoring cave containment building is designed to manage ~~containers~~ canisters ~~which~~ that are ~~undergo decontamination in tank systems and to~~ swab~~ the containers~~bed to determine whether ~~decontamination has been effective~~they meet the surface radiological requirements. The containment building will be a ~~C5~~ C3 area~~. Conducting these activities in a C5 zone will prevent the spread of contaminated materials. The containment building is under negative pressure and therefore no air particulates can escape the unit~~. The air from the unit passes through HEPA filtration prior to discharge out of the plant stack.

Personnel access to the ~~IHLW container~~ canister ~~decontamination~~swab and monitoring cave containment building, which is classified as a ~~C5~~ C3 ~~contamination~~ area, will be limited ~~due to radiological concerns~~. Therefore, personnel moving into and out of the unit will not track contamination out of the unit.

~~Control of Fugitive Dust from the IHLW Container Decontamination Containment Building~~
~~Operational controls and the HLW vitrification plant ventilation system will be used to control fugitive dust emissions from the unit to meet the requirements of 40 CFR 264.11101(c)(1)(iv). The following measures will be used to prevent fugitive dust from escaping the IHLW container decontamination containment building.~~

- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Greater negative air pressure in the unit, compared to adjacent C3 units, to pull air into the unit and prevent backflow~~
- ~~Intake air through controlled air in-bleed units with backflow prevention dampers~~
- ~~Safety interlocks to shut down C3 extract fans to prevent backflow if the C5 system shuts down~~
- ~~Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~
- ~~A multiple fan extraction system, designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair~~
- ~~Personnel ingress and egress through airlocks and subchange rooms~~

Procedures in the Event of Release or Potential for Release from the IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building
Conditions that could lead to a release from the IHLW ~~container~~ canister ~~decontamination~~swab and monitoring cave containment building will be corrected as soon as possible after they are identified. ~~The ventilation system, the most likely source of potential releases, is designed with two stages of HEPA filters with backup HEPA filters to facilitate repairs and replacement.~~

In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Administrative and operating methods to satisfy this requirement will be developed prior to the start of operations.

Inspections of the IHLW ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring Cave Containment Building
An inspection program will be established as required under WAC 173-303-695~~,~~ to detect conditions that could lead to release of wastes from the IHLW ~~container~~ canister ~~decontamination~~swab and monitoring cave containment building. The inspection and monitoring schedule and methods that will be used to detect a release ~~is~~ are included in Chapter 6.

~~4.2.4.10~~4.2.4.14 ~~HLW Vitrification Plant~~ C3 Workshop Containment Building (H-0311A, H-0~~/~~311A~~/B~~)

The ~~HLW vitrification plant~~ C3 workshop containment building will be located in the northeast side of the HLW vitrification plant at elevation 37 feet.

Typical waste management activities performed in this containment building include decontamination, size reduction, and packaging of spent equipment. Equipment will be transported to the unit contained in shielded casks, drums, or in a standard waste box. In the workshop, the equipment will be decontaminated to enable "hands-on" maintenance. Spent equipment parts will be bagged and placed in standard waste containers or boxes for disposal. Size reduction may be performed to facilitate packaging. Other spent equipment will be packaged in drums or standard waste boxes.

~~HLW Vitrification Plant~~ C3 Workshop Containment Building Design

The ~~HLW vitrification plant~~ C3 workshop containment building will be designed as a completely enclosed area within the HLW vitrification plant. It will be designed to prevent the release of dangerous waste and their exposure to the outside environment. The design and construction of the HLW vitrification plant exterior will prevent water from running into the plant. The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and vapor barrier. Rainwater run-off will be collected by roof drains and drainage systems with overflow roof drains. The approximate dimensions of the unit are summarized in Table 4-12.

~~HLW Vitrification Plant~~ C3 Workshop Containment Building Structure

The ~~HLW vitrification plant~~ C3 workshop containment building will be a concrete-walled structure fully enclosed within the HLW vitrification plant. Therefore, structural requirements for the containment building will be met by the design standards of the HLW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~ Supplement 1 provides documentation that the seismic requirements for the HLW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements. ~~The seismic requirements for the HLW vitrification plant are presented in *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, found in Supplement 1.~~

~~HLW Vitrification Plant~~ C3 Workshop Containment Building Materials

The ~~HLW vitrification plant~~ C3 workshop containment building will be constructed of steel-reinforced concrete. The interior floor and a portion of the walls of the unit will be lined with stainless steel or protective coating. ~~The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and vapor barrier. Rainwater run-off will be collected by roof drains and drainage systems with overflow roof drains.~~

Use of Incompatible Materials in the ~~HLW Vitrification Plant~~ C3 Workshop Containment Building

A partial stainless steel liner or protective coating will be provided for this unit. Stainless steel or the protective coating will be compatible with the equipment wastes that will be managed. Activities in the unit will be limited to decontamination, size reduction, and packaging the waste components into drums or waste boxes. Treatment reagents that could cause the liner or coating to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the ~~HLW Vitrification Plant~~ C3 Workshop Containment Building

The ~~HLW vitrification plant~~ C3 workshop containment building is designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the ~~HLW Vitrification Plant~~ C3 Workshop Containment Building

Prior to startup of operations, a certification by a qualified registered professional engineer that the ~~HLW vitrification plant~~ C3 workshop containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because the waste managed in the unit will not contain free liquids or be treated with free liquids.

Operation of the ~~HLW Vitrification Plant~~ C3 Workshop Containment Building

Operational and maintenance controls and practices will be established and followed to ensure containment of the dangerous wastes within the ~~HLW vitrification plant~~ C3 workshop containment building unit as required by 40 CFR 264.1101(c)(1).

Maintenance of the ~~HLW Vitrification Plant~~ C3 Workshop Containment Building

The stainless steel lining or protective coating of the unit will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The stainless steel liner or the protective coating will remain free of corrosion or other deterioration because it is compatible with materials that will be managed in the containment building. The failed equipment that will be managed in the containment building unit will be compatible with stainless steel or the protective coating. Only decontamination chemicals that are compatible with the liner or coating will be used.

Measures to Prevent Tracking Wastes from the ~~HLW Vitrification Plant~~ C3 Workshop Containment Building

The ~~HLW vitrification plant~~ C3 workshop containment building will be designed to isolate failed equipment from the accessible environment and to prevent the spread of contaminated materials. Very little dust is expected to be generated in the unit.

~~Personnel access to t~~The containment building will be ~~limited due to radiological concerns. It will be~~ classified as a C3 contamination area, which allows only limited access by personnel. Personnel access will be via a C2/C3 subchange room. Equipment will enter and exit the workshop via a C2/C3 airlock. Wastes leaving the unit will be enclosed within containers. If necessary, the containers will be decontaminated in the unit prior to transportation to a permitted storage area. Equipment leaving the unit will be decontaminated, when necessary, before being released for removal from the cells.

~~Control of Fugitive Dust from the HLW Vitrification Plant C3 Workshop Containment Building~~

~~The following measures will be used to prevent fugitive dust from escaping the HLW vitrification plant C3 workshop containment building:~~

- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Intake air through controlled air in-bleed units, with backflow prevention dampers~~
- ~~Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~
- ~~A multiple fan extraction system designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair~~
- ~~Personnel ingress and egress through airlocks and subchange rooms~~

Procedures in the Event of Release or Potential for Release from the ~~HLW Vitrification Plant~~ C3 Workshop Containment Building

The design and operation of the unit makes it very unlikely that releases will occur. The design and operational measures will minimize the generation of dust and contain it within the unit~~.~~ ~~The ventilation system will also use negative air pressure to keep contamination from areas of lesser contamination, and will use two-stage HEPA filtration to reduce the release of particles.~~

~~Inspections will identify conditions that could lead to a release. Such conditions will be corrected as soon as possible after they are identified.~~ In the unlikely event that a release of dangerous wastes from the containment building is detected, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods that will be used to satisfy this requirement will be developed prior to the start of operations. These methods will be followed to repair conditions that could lead to a release.

Inspections of the ~~HLW Vitrification Plant~~ C3 Workshop Containment Building

An inspection program will be established to detect conditions that could lead to a release of wastes from the ~~HLW vitrification plant~~ C3 workshop containment building. The inspection and monitoring schedule and methods that will be used to detect releases from the unit ~~is~~ are included in Chapter 6.

~~4.2.4.11~~4.2.4.15 ~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building (H-0104)

The ~~HLW vitrification plant air filtration~~filter cave containment building is located in the northwest portion of the plant. The ~~HLW vitrification plant air filtration~~filter cave containment building will manage spent HEPA ~~and HEME~~ filters via an overhead crane. The crane transports the spent filters to a size reduction station and then places them inside a disposal container. The disposal container is then transported via cart, through an air lock and shield doors and to a load-out area for storage pending final disposal. The containment building also houses a hands-on crane decontamination and repair area.

~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building Design

The ~~HLW vitrification plant air filtration~~ filter cave containment building will be completely enclosed within the HLW vitrification plant, and will be designed to prevent the release and exposure of dangerous constituents to the outside environment. The design and construction of the HLW vitrification plant exterior will prevent water from running into the plant. The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Run-on will be collected by roof drains and a drainage system with overflow drains. The approximate dimensions of the containment building are summarized in Table 4-12.

~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building Structure

Because the ~~HLW vitrification plant air filtration~~filter cave containment building will be a concrete-walled structure fully enclosed within the HLW vitrification plant, its requirements will be met by the design standards of the HLW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP ~~. –~~Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the HLW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements for the HLW vitrification plant are presented in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, found in Attachment 51, Chapter 4, Supplement 1.~~

~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building Materials

The ~~HLW vitrification plant air filtration~~filter cave containment building will be constructed of steel-reinforced concrete. The interior floor and a portion of the walls will be lined with a protective coating. ~~The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Run-on will be collected by roof drains and a drainage system with overflow drains.~~

Use of Incompatible Materials for the ~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building

A protective coating will be provided for the containment building. The coating will be compatible with the wastes that will be managed in the unit, which will include spent HEPA ~~and HEME~~ filters. Activities in the unit will be limited to HEPA filter change -out and size reduction and waste packaging. Treatment reagents that could cause the protective coating to leak, corrode, or otherwise fail will not be used within the unit.

Primary Barrier Integrity in the ~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building

The ~~HLW vitrification plant air filtration~~filter cave containment building will be designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in ~~Supplement 1~~DWP Attachment 51, Supplement 1~~,~~ ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the ~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building

Prior to the start of operations, certification by a qualified registered professional engineer that the ~~HLW vitrification plant air filtration~~filter cave containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40

CFR 264.1101(b) do not apply to this design because dangerous waste containing free liquids will not be managed in the unit and waste will not be treated with free liquids.

Operation of the ~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building

Operational and maintenance controls and practices will be established to ensure containment of the waste within the ~~HLW vitrification air filtration~~filter cave containment building, as required by 40 CFR 264.1101(c)(1).

Maintenance of the ~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building

The protectively-coated concrete floor and walls of the unit will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The protective coating will be compatible with materials that will be managed in the containment building, which will include spent HEPA ~~and HEME~~ filters. No decontamination chemicals that are incompatible with the coated concrete will be used.

Measures to Prevent Tracking Wastes from the ~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building

The ~~HLW vitrification plant air filtration~~filter cave containment building is designed to manage spent HEPA ~~and HEME~~ filters. Conducting these activities in a ~~C3~~ C5 zone will prevent the spread of contaminated materials. ~~Limited personnel access and~~ Controlled movement of equipment into and out of the unit will decrease the possibility that waste will be tracked from the unit.

Personnel access to the ~~HLW vitrification plant air filtration~~filter cave containment building, which is classified as a ~~C3~~ C5 contamination area, will be ~~limited~~ restricted~~ due to radiological concerns. Access to the unit will be allowed only under limited circumstances, thereby limiting the potential for contacting the waste and tracking it from the unit~~.

~~Control of Fugitive Dust from the HLW Vitrification Plant Air Filtration Containment Building~~

~~The following measures will be used to prevent fugitive dust from escaping the HLW vitrification plant air filtration containment building unit.~~

- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Greater negative air pressure in the unit, compared with adjacent C2 units, to pull air into the unit and prevent backflow~~
- ~~Intake air through controlled air in-bleed units, with backflow prevention dampers~~
- ~~HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~
- ~~A multiple fan extraction system designed to maintain negative pressure, and cascading air flow, even during fan maintenance and repair~~
- ~~Personnel ingress and egress through airlocks and subchange rooms~~

Procedures in the Event of Release or Potential for Release from the ~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building

Conditions that could lead to a release from the ~~HLW vitrification plant air filtration~~filter cave containment building will be corrected as soon as possible after they are identified. ~~The ventilation system and airlocks, the most likely sources of potential releases, will be designed with backup HEPA filters to facilitate repairs and replacement.~~

In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods that will be used to satisfy this requirement will be developed prior to the start of operations.

Inspections of the ~~HLW Vitrification Plant Air Filtration~~Filter Cave Containment Building

An inspection program will be established to detect conditions that could lead to a release of wastes from the HLW vitrification plant air filtration containment building. The inspection and monitoring schedule~~,~~ and methods that will be used to detect releases from the unit~~,~~ are included in Chapter 6.

~~**4.2.4.12HLW Vitrification Plant Drum Transfer Tunnel Containment Building**~~

~~The HLW vitrification plant drum transfer tunnel containment building stretches east to west, nearly the entire length of the HLW vitrification plant. Typical waste management activities performed in this containment building include size reduction, storage of uncontainerized waste, and packaging of failed and spent equipment.~~

~~HLW Vitrification Plant Drum Transfer Tunnel Containment Building Design~~

~~The HLW vitrification plant drum transfer containment building will be completely enclosed within the HLW vitrification plant, and will be designed to prevent the release and exposure of dangerous constituents to the outside environment. The design and construction of the HLW vitrification plant exterior will prevent water from running into the plant. The approximate dimensions of the containment building are summarized in Table 4-12.~~

~~HLW Vitrification Plant Drum Transfer Tunnel Containment Building Structure~~

~~Because the HLW vitrification plant drum transfer tunnel containment building will be a concrete-walled structure fully enclosed within the HLW vitrification plant, its requirements will be met by the design standards of the HLW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. The seismic requirements for the HLW vitrification plant are presented in the *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, found in Supplement 1.~~

~~HLW Vitrification Plant Drum Transfer Tunnel Containment Building Materials~~

~~The HLW vitrification plant drum transfer tunnel containment building will be constructed of steel reinforced concrete. The interior floor and a portion of the walls will be lined with a protective coating. The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Run-on will be collected by roof drains and a drainage system with overflow drains.~~

~~Use of Incompatible Materials for the HLW Vitrification Plant Drum Transfer Tunnel Containment Building~~

~~A protective coating will be provided for the containment building. The coating will be compatible with the wastes that will be managed in the unit, which will include out-of-service process equipment, including pumps, valve, filters, jumpers, and maintenance equipment. Reagents that could cause the liner to leak, corrode, or otherwise fail will not be used within the unit.~~

~~Primary Barrier Integrity in the HLW Vitrification Plant Drum Transfer Tunnel Containment Building~~

~~The HLW vitrification plant drum transfer tunnel containment building will be designed to withstand loads from the movement of wastes and handling equipment. The seismic design criteria found in Supplement 1, ensures appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.~~

~~Certification of Design for the HLW Vitrification Plant Drum Transfer Tunnel Containment Building~~

~~Prior to the start of operations, certification by a qualified registered professional engineer that the HLW vitrification plant drum transfer tunnel containment building meets the design requirements of 40 CFR 264.1101(a), (b), and (c) will be obtained.~~

~~Operation of the HLW Vitrification Plant Drum Transfer Tunnel Containment Building~~

~~Operational and maintenance controls and practices will be established to ensure containment of the waste within the HLW vitrification plant drum transfer tunnel containment building, as required by 40 CFR 264.1101(c)(1).~~

~~Maintenance of the HLW Vitrification Plant Drum Transfer Tunnel Containment Building~~

~~The protectively coated concrete floor and walls of the unit will be constructed and maintained in a manner that will be free of significant cracks, gaps, corrosion, or other deterioration. The protective coating will be compatible with materials that will be managed in the containment building, which will include the out-of-service process equipment and containerized waste and equipment. No decontamination chemicals that are incompatible with the coated concrete will be used.~~

~~Measures to Prevent Tracking Wastes from the HLW Vitrification Plant Drum Transfer Tunnel Containment Building~~

~~The HLW vitrification plant drum transfer tunnel containment building is designed to provide a means to dispose of spent equipment by providing lifting, holding, and transporting of disposal containers. The unit also supports size reduction and packaging of waste containers. Conducting these activities in a C3 zone will prevent the spread of contaminated materials. Limited personnel access and controlled movement of equipment into and out of the unit will decrease the possibility that waste will be tracked from the unit.~~

~~Personnel access to the HLW vitrification plant drum transfer tunnel containment building, which is classified as a C3 contamination area, will be limited due to radiological concerns. Access to the unit will be allowed only under limited circumstances, thereby limiting the potential for contacting the waste and tracking it from the unit.~~

~~Control of Fugitive Dust from the HLW Vitrification Plant Drum Transfer Tunnel Containment Building~~

~~The following measures will be used to prevent fugitive dust from escaping the HLW vitrification plant drum transfer tunnel containment building unit:~~

- ~~A cascading air flow from areas of least to greatest potential contamination (i.e., C2 to C3 to C5)~~
- ~~Greater negative air pressure in the unit, compared with adjacent C2 units, to pull air into the unit and prevent backflow~~
- ~~Intake air through controlled air in-bleed units, with backflow prevention dampers~~
- ~~Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack~~
- ~~A multiple fan extraction system designed to maintain negative pressure, and cascading air flow, even during fan maintenance and repair~~
- ~~Personnel ingress and egress through airlocks and subchange rooms~~

~~Procedures in the Event of Release or Potential for Release from the HLW Vitrification Plant Drum Transfer Tunnel Containment Building~~

~~Conditions that could lead to a release from the HLW vitrification plant drum transfer tunnel containment building will be corrected as soon as possible after they are identified. The ventilation system and airlocks, the most likely sources of potential releases, will be designed with backup HEPA filters to facilitate repairs and replacement.~~

~~In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Specific administrative and operating methods that will be used to satisfy this requirement will be developed prior to the start of operations.~~

~~Inspections of the HLW Vitrification Plant Drum Transfer Tunnel Containment Building~~

~~An inspection program will be established to detect conditions that could lead to a release of wastes from the HLW vitrification plant drum transfer tunnel containment building. The inspection and monitoring schedule, and methods that will be used to detect releases from the unit, are included in Chapter 6.~~

4.2.4.16 HLW Pour Tunnel No. 1 Containment Building (H-B032) and HLW Pour Tunnel No. 2 Containment Buildings ~~(H-B032 and~~ (H-B005A)

HLW ~~P~~pour tunnels No. 1 and No. 2 containment building contain bogies that transport empty canisters to the melter pour spout. Each of the two pour tunnels are 11 ft~~.~~ wide by 85 ft~~.~~ -2" in.

long extending from the south end of the melter caves in a north-south direction to an area below the canister handling cave. The glass pouring into canisters takes place in the north half of the HLW pour tunnels No.1 and No. 2 containment buildings. After filling with glass, the canisters are allowed to cool down prior to being transported to the south portion of the HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnels 1 and 2~~ and transferred through the hatch to the canister handling cave located above. The south portion of the HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnels 1 and 2~~ can be used for bogie decontamination, if required, prior to handling in the bogie maintenance area. The bogie maintenance area is segregated from HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnels 1 and 2~~ by a shield door. Bogie decontamination is not considered a dangerous waste management activity performed within the boundary of HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnels 1 and 2~~.

HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Building Design

The HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnel containment buildings~~ will be completely enclosed within the HLW vitrification plant, and will be designed to prevent the release of dangerous constituents and their exposure to the outside environment. The design and construction of the HLW vitrification plant exterior will prevent water from running into the facility. The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Runoff will be collected by roof drains and a drainage system with overflow roof drains. Unit dimensions are summarized in Table 4-12.

The containment buildings' design requirements of 40 CFR 264.1101(b) do not apply because there are no liquid dangerous wastes managed in the pour tunnels.

HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Building~~Pour Tunnel Containment Building~~ Structure

Because the HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnels~~ will be concrete-walled structures fully enclosed within the HLW vitrification plant, their structural requirements will be met by the design standards of the HLW vitrification plant. The design will ensure that the units have sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the HLW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements that the buildings must address are presented in *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, provided in Attachment 51, Chapter 4, Supplement 1.~~

HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Building~~Pour Tunnel Containment Building~~ Unit Materials

The HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnel containment buildings~~ will be constructed of steel-reinforced concrete. The interior floors and a portion of the walls of the units will be lined with stainless steel to protect the insulation and concrete from the effects of high temperatures. ~~The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Runoff will be collected by roof drains and a drainage system with overflow roof drains.~~

Use of Incompatible Materials for the HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Buildings~~Pour Tunnel Containment Buildings~~

There are no liquid dangerous wastes managed within the HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnel containment buildings~~.

Primary Barrier Integrity in the HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Buildings~~Pour Tunnel Containment Buildings~~

The HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnel containment buildings~~ are designed to withstand loads from the movement of wastes and handling equipment. The seismic design criteria found in DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Buildings~~Pour Tunnel Containment Building~~

Prior to the start of operations, certification by a qualified~~,~~ registered professional engineer that the HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnel containment buildings~~ meet the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because no free liquids are managed in the unit.

Operation of the HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Building~~Pour Tunnel Containment Buildings~~

Operational and maintenance controls and practices will be established to ensure containment of the wastes within the HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnel containment buildings~~, as required by 40 CFR 264.1101(c)(1).

Maintenance of the HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Buildings~~Pour Tunnel Containment Buildings~~

~~A~~The partial stainless-steel liner will be installed in the HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnel containment buildings~~ to protect insulation and concrete from the effects of high temperatures. Waste canisters will not be stacked within the unit.

Measures to Prevent Tracking Wastes from the HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Buildings~~Pour Tunnel Containment Buildings~~

The HLW vitrification plant C5 HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnel containment buildings~~ will be designed to isolate failed equipment from the accessible environment and to prevent the spread of contaminated materials. Very little dust is expected to be generated in the unit.

Personnel access to the HLW pour tunnels No.1 and No. 2 containment buildings~~containment building~~ will not be allowed because of high radiation.

Control of Fugitive Dust from the HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Buildings~~Pour Tunnel Containment Buildings~~

Operational controls of the HLW vitrification plant ventilation system will be used to control fugitive dust emissions from the units to meet the requirements of 40 CFR 264.1101(c)(1)(iv). The following measures will be used to prevent fugitive dust from escaping the HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnel containment buildings~~:

- A cascading air flow from areas of least to greatest potential contamination (~~i.e~~that is~~.~~, C2 to C3 to C5)
- Greater negative air pressure in the unit, compared to adjacent C3 units, to pull air into the unit and prevent backflow
- Intake air through controlled air in-bleed units with backflow prevention dampers
- Safety interlocks to shut down C3 extract fans to prevent backflow if the C5 system shuts down
- Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack
- A multiple fan extraction system, designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair
- Personnel ingress and egress through airlocks and subchange rooms

Procedures in the Event of Release or Potential for Release from the HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Buildings~~Pour Tunnel Containment Buildings~~

Conditions that could lead to a release from the HLW pour tunnels No.1 and No. 2 containment buildings~~pour tunnel containment buildings~~ will be corrected as soon as possible after they are identified. In the unlikely event of a release of dangerous wastes from the containment buildings, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Administrative and operating methods to satisfy this requirement will be developed prior to the start of operations.

Inspections of the HLW Pour Tunnel No. 1 and HLW Pour Tunnel No. 2 Containment Buildings~~Pour Tunnel Containment Buildings~~

An inspection program will be established as required under WAC 173-303-695~~,~~ to detect conditions that could lead to the release of wastes from the HLW pour tunnel containment buildings. The inspection and monitoring schedule and methods that will be used to detect a release are included in DWP Attachment 51, Chapter 6.

4.2.4.17 HLW Drum Swabbing and Monitoring Area Containment Building (H-0126A, H-0126B, and H-B028)

The HLW drum swabbing and monitoring area containment building is located in the northeast section of the HLW vitrification plant. Typical waste management activities performed in this containment building include the remote handling of 55 US gallon drums. The drums will be swabbed for surface contamination and decontaminated if needed.

Upon arrival in the HLW drum swabbing and monitoring area, the 55 US gallon drums are weighed, monitored ~~for activity using a gamma monitor mounted in the cell~~, and then transferred through a hatch and placed into a shielded cask in the cask handling area.

In the cask handling area, drum transport casks are remotely lidded and moved to the truck loading bay for removal from the facility.

Drum Swabbing and Monitoring Area Containment Building Design

The drum swabbing and monitoring area containment building will be completely enclosed within the HLW vitrification plant, and will be designed to prevent the release of dangerous constituents and their exposure to the outside environment. The design and construction of the HLW vitrification plant exterior will prevent water from running into the plant. The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Runoff will be collected by roof drains and a drainage system with overflow roof drains. Unit dimensions are summarized in Table 4-12.

The containment building design requirements of 40 CFR 264.1101(b) do not apply because the liquid dangerous wastes will not be managed in the drum swabbing and monitoring area. If liquid dangerous wastes are stored in 55 US gallon drums, the drums will be provided with portable secondary containment.

HLW Drum Swabbing and Monitoring Area Containment Building Structure

Because the HLW drum swabbing and monitoring area will be a concrete-walled structure fully enclosed within the HLW vitrification plant, its structural requirements will be met by the design standards of the HLW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the HLW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements that the building must address are presented in *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, provided in Attachment 51, Chapter 4, Supplement 1.~~

HLW Drum Swabbing and Monitoring Area Containment Building Unit Materials

The HLW drum swabbing and monitoring area containment building will be constructed of steel-reinforced concrete. The interior floor and a portion of the walls of the unit will be covered with special protective coating to protect the concrete from ~~radiological~~mixed waste contamination. ~~The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Runoff will be collected by roof drains and a drainage system with overflow roof drains.~~

Use of Incompatible Materials for the HLW Drum Swabbing and Monitoring Area Containment Building

There are no liquid dangerous wastes managed within the HLW drum swabbing and monitoring containment building.

Primary Barrier Integrity in the HLW Drum Swabbing and Monitoring Area Containment Building

The HLW drum swabbing and monitoring area containment building is designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the HLW Drum Swabbing and Monitoring Area Containment Building

Prior to the start of operations, certification by a qualified~~,~~ registered professional engineer that the HLW drum swabbing and monitoring area containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because free liquids managed in the unit are addressed under tank systems in section 4.2.2.

Operation of the HLW Drum Swabbing and Monitoring Area Containment Building

Operational and maintenance controls and practices will be established to ensure containment of the wastes within the HLW drum swabbing and monitoring area containment building, as required by 40 CFR 264.1101(c)(1).

Maintenance of the HLW Drum Swabbing and Monitoring Area Containment Building

Personnel access to the containment building will not be allowed because of high radiation. Drums are not normally expected to be stacked within the unit.

Measures to Prevent Tracking Wastes from the HLW Drum Swabbing and Monitoring Area Containment Building

The HLW vitrification plant C5 HLW drum swabbing and monitoring containment building will be designed to isolate failed equipment from the accessible environment and to prevent the spread of contaminated materials. Very little dust is expected to be generated in the unit.

Control of Fugitive Dust from the HLW Drum Swabbing and Monitoring Area Containment Building

Operational controls of the HLW vitrification plant ventilation system will be used to control fugitive dust emissions from the unit to meet the requirements of 40 CFR 264.1001(c)(1)(iv). The following measures will be used to prevent fugitive dust from escaping the HLW d~~D~~rum ~~S~~swabbing and ~~M~~monitoring a~~A~~rea c~~C~~ontainment ~~B~~building:

- A cascading air flow from areas of least to greatest potential contamination (~~i.e.~~that is, C2 to C3 to C5)
- Greater negative air pressure in the unit, compared to adjacent C3 units, to pull air into the unit and prevent backflow
- Intake air through controlled air in-bleed units with backflow prevention dampers

- Safety interlocks to shut down C3 extraction fans to prevent backflow, if the C5 system shuts down
- Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack
- A multiple fan extraction system, designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair

~~Personnel ingress and egress through airlocks and subchange rooms~~

Procedures in the Event of Release or Potential for Release from HLW Drum Swabbing and Monitoring Area Containment Building

Conditions that could lead to a release from the HLW drum swabbing and monitoring area containment building will be corrected as soon as possible after they are identified. In the unlikely event of a release of mixed or dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Administrative and operating methods to satisfy this requirement will be developed prior to the start of operations.

Inspections of the HLW Drum Swabbing and Monitoring Area Containment Building

An inspection program will be established as required under WAC 173-303-695~~,~~ to detect conditions that could lead to the release of wastes from the HLW drum swabbing and monitoring area containment building. The inspection and monitoring schedule and methods that will be used to detect a release are include in DWP Attachment 51, Chapter 6.

4.2.4.18 HLW Waste Handling Area Containment Building (~~H-410, H-410A,~~ H-410B, ~~and~~ H-411)

The HLW waste handling area containment building consists of rooms ~~H-410, H-410A,~~ H-410B, and H-411 on the 58 ~~foot~~ft elevation of the HLW vitrification plant. Typical waste management activities performed in this containment building include waste sorting, segregation, and providing temporary storage of mixed waste containers (~~i.e.~~that is, spent silver mordenite). The HLW waste handling area containment building ~~waste handling room~~ will contain floor space for segregated storage of empty and full containers, typically 55 gallon waste drums. Tools and equipment will also be stored in this containment building.

HLW Waste Handling Area Containment Building Design

The HLW waste handling area containment building will be completely enclosed within the HLW vitrification plant, and will be designed to prevent the release of dangerous constituents and their exposure to the outside environment. The design and construction of the HLW vitrification plant exterior will prevent water from running into the plant. The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Runoff will be collected by roof drains and a drainage system with overflow roof drains. Unit dimensions are summarized in Table 4-12.

The containment building design requirements of 40 CFR 264.1101(b) do not apply because the liquid dangerous wastes will not be managed in the waste handling area. If liquid wastes are stored in 55 US gallon drums, the drums will be provided with portable secondary containment.

HLW Waste Handling Area Containment Building Structure

Because the HLW waste handling area containment building~~waste handling area~~ will be a concrete-walled structure fully enclosed within the HLW vitrification plant, its structural requirements will be met by the design standards of the HLW vitrification plant. The design will ensure that the unit has sufficient structural strength to prevent collapse or failure. DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 provides documentation that the seismic requirements for the HLW vitrification plant meet or exceed the Uniform Building Code Seismic Design Requirements.~~The seismic requirements that the building must address are presented in *RPP-WTP Compliance with Uniform Building Code Seismic Design Requirements*, provided in Attachment 51, Chapter 4, Supplement 1.~~

HLW Waste Handling Area Containment Building Unit Materials

The HLW waste handling area containment building will be constructed of steel-reinforced concrete. The interior floor and a portion of the walls of the unit will be covered with special protective coatings to protect the concrete from ~~radiological~~mixed waste contamination~~ in accordance with ALARA principles. The roof of the HLW vitrification plant will consist of metal roofing, roof insulation, and a vapor barrier. Runoff will be collected by roof drains and a drainage system with overflow roof drains.~~

Use of Incompatible Materials for the HLW Waste Handling Area Containment Building

There are no liquid dangerous wastes managed within the HLW waste handling area containment building.

Primary Barrier Integrity in the HLW Waste Handling Area Containment Building

The HLW waste handling area containment building is designed to withstand loads from the movement of personnel, wastes, and handling equipment. The seismic design criteria found in DWP Attachment 51, ~~Chapter 4, Supplement 1~~Supplement 1 ensures that appropriate design loads, load combinations, and structural acceptance criteria are employed at the WTP.

Certification of Design for the HLW Waste Handling Area Containment Building

Prior to the start of operations, certification by a qualified~~,~~ registered professional engineer that the HLW waste handling area containment building meets the design requirements of 40 CFR 264.1101(a) and (c) will be obtained. The requirements of 40 CFR 264.1101(b) do not apply to this design because free liquids will not be managed in the unit.

Operation of the HLW Waste Handling Area Containment Building

Operational and maintenance controls and practices will be established to ensure containment of the wastes within the HLW waste handling area containment building, as required by 40 CFR 264.1101(c)(1).

Maintenance of the HLW Waste Handling Area Containment Building

Wastes are not normally expected to be stacked within the unit.

Measures to Prevent Tracking Wastes from the HLW Waste Handling Area Containment Building

Wastes leaving the HLW waste handling area containment building will be enclosed within containers. If necessary, these containers will be decontaminated in the unit prior to transportation to another permitted ~~storage, treatment, or disposal~~TSD facility.

Control of Fugitive Dust from the HLW Waste Handling Area Containment Building

Operational controls of the HLW vitrification plant ventilation system will be used to control fugitive dust emissions from the unit to meet the requirements of 40 CFR 264.1101(c)(1)(iv). The following measures will be used to prevent fugitive dust from escaping the waste handling area containment building:

- A cascading air flow from areas of least to greatest potential contamination (~~i.e.~~that is, C2 to C3 to C5)
- Greater negative air pressure in the unit, compared to adjacent C3 units, to pull air into the unit and prevent backflow
- Intake air through controlled air in-bleed units with backflow prevention dampers
- Safety interlocks to shut down C3 extraction fans to prevent backflow if the C5 system shuts down
- Dual HEPA filtration of exhaust air before discharge to the atmosphere through a monitored stack
- A multiple fan extraction system, designed to maintain negative pressure and cascading air flow, even during fan maintenance and repair
- Personnel ingress and egress through airlocks and subchange rooms

Procedures in the Event of Release or Potential for Release from HLW Waste Handling Area Containment Building

Conditions that could lead to a release from the HLW waste handling area containment building will be corrected as soon as possible after they are identified. In the unlikely event of a release of dangerous wastes from the containment building, actions required by 40 CFR 264.1101(c)(3)(i) through (iii) will be taken. Administrative and operating methods to satisfy this requirement will be developed prior to the start of operations.

Inspections of the HLW Waste Handling Area Containment Building

An inspection program will be established as required under WAC 173-303-695~~,~~ to detect conditions that could lead to the release of wastes from the HLW waste handling area containment building. The inspection and monitoring schedule and methods that will be used to detect a release are included in DWP Attachment 51, Chapter 6.

4.3 OTHER WASTE MANAGEMENT UNITS

Sections 4.3.1 through 4.3.5 discuss the applicability of the requirements for waste management units that have not been discussed up to this point in the ~~DWPA~~permit. Sections 4.3.6 ~~through~~ through 4.3.9 describe the applicability of air emission controls, waste minimization, groundwater monitoring, and functional design requirements to the WTP. References to other sections of the ~~DWPA~~ permit are provided as appropriate.

4.3.1 Waste Piles [D-3]

The operation of the WTP does not involve the placement of dangerous waste in waste piles. Therefore, the requirements of WAC 173-303-660, "Waste Piles", do not apply to the WTP.

4.3.2 Surface Impoundments [D-4]

The operation of the WTP does not involve the placement of dangerous waste in surface impoundments. Therefore, the requirements of WAC 173-303-650, "Surface Impoundments", do not apply to the WTP.

4.3.3 Incinerators [D-5]

The WTP does not include a dangerous waste incinerator. Therefore, the requirements of WAC 173-303-670, "Incinerators", do not apply to the WTP.

4.3.4 Landfills [D-6]

The operation of the WTP does not involve the placement of dangerous waste in landfills. Therefore, the requirements of WAC 173-303-665, "Landfills", do not apply to the WTP.

4.3.5 Land Treatment [D-7]

The operation of the WTP does not involve the land treatment of dangerous waste. Therefore, the requirements of WAC 173-303-655, "Land Treatment", do not apply to the WTP.

4.3.6 Air Emissions Control [D-8]

Information regarding air emissions control is provided in the following sections:

- Pretreatment plant vessel ven~~tilation system description~~ process and exhaust system (PVP/PVV) - ~~S~~section 4.1.2.17
- LAW vitrification offgas treatment system description - s~~S~~ection 4.1.~~4~~3.3
- HLW vitrification offgas treatment system description - s~~S~~ection 4.1.~~5~~4.3
- Process vents~~–~~ (40 CFR~~Part~~ 264 Subpart AA) - s~~S~~ection 4.2.2.10.2
- Equipment leaks (40 CFR~~Part~~ 264 Subpart BB) - s~~S~~ection 4.2.2.10.3
- Tanks and containers (40 CFR~~Part~~ 264 Subpart CC) - s~~S~~ection 4.2.2.10.4

4.3.7 Waste Minimization [D-9]

Waste minimization information is presented in Chapter 10 of the permit~~-application~~.

4.3.8 Groundwater Monitoring for Land-Based Units [D-10]

The groundwater monitoring requirements found in WAC 173-303-645, "Releases from regulated units~~,~~", do not apply to the WTP, since it is not operated as a regulated dangerous waste surface impoundment, landfill, land treatment area or waste pile, as defined in WAC 173-303-040. Therefore, groundwater monitoring is not required.

4.3.9 Functional Design Requirements

The WTP will be designed to comply with applicable design codes and specifications. The ~~*Basis of Design* (BNI 2001) provides the design basis for the structures, systems, and components of the WTP~~documents referenced in this chapter and contained in DWP Attachment 51 identify the codes and standards to which the WTP system, structures, and components are being constructed.

Table 4-1 Example Piping Material Service Class Index

Table 4-1 has been deleted and ~~replaced~~superceded by *Piping Material Class Description,* (24590-WTP-PER-PL-02-001), ~~located in~~ (DWP, Attachment 51, Appendix 4).

~~Table 4-1 Example Piping Material Service Class Index~~
~~Class (Old) Design Code/Service Press/Temp Limits Psig @ °F Flange Pressure Class Corrosion/~~
~~Erosion Allow (in.) Pipe Large Fittings Small Fittings Valve Body Valve Trim Gasket~~
~~B19A~~
~~(BB) Uniform Plumbing Code~~
~~(WV) Potable Water Based on Design~~
~~130 @ 200 CL 150~~
~~B16.24 0.240 Copper 3/8" 4", Type L Cast Copper Alloy Cast Copper Alloy Cast Bronze/ Cast Iron~~
~~Bronze Neoprene/ Red Rubber/ EPDM~~
~~C12A~~
~~(CA) ASME B31.3, Normal Fluid Service~~
~~(GQ) Process Air~~
~~(GK) 150 Psig Air~~
~~(GN) Nitrogen~~
~~(GA) Argon~~
~~(WB) Cooling Water Supply~~
~~(WC) Cooling Water Return~~
~~(WK) Chilled Water Supply~~
~~(WL) Chilled Water Return~~
~~(ZA) Non Dangerous, Non Radioactive Liquid Effluent Based on ASME B16.5~~
~~285 @ 20/100~~
~~200 @ 400 CL 150~~
~~B16.5 0.0625 Carbon Steel 1/2" 1 1/2", XS~~
~~2" 24", STD 30", STD Carbon Steel Carbon Steel Carbon Steel 13CR HFS 304 SS Spiral Wound~~
~~/ASME B16.20~~
~~C12B~~
~~(CB) ASME B31.3, Normal Fluid Service~~
~~(DB, (DC), (DL) Steam~~
~~(ZU) Non Radioactive Condensate Based on ASME B16.5~~
~~285 @ 20/100~~
~~200 @ 400 CL 150~~
~~B16.5 0.0625 Carbon Steel 1/2" 1 1/2", XS~~
~~2" 24", STD Carbon Steel Carbon Steel Carbon Steel 13CR HFS 304 SS Spiral Wound /ASME~~
~~B16.20~~
~~C12D~~
~~(CD) ASME B31.3, Normal Fluid Service~~
~~(XM) Fuel Oil~~
~~(XK) Diesel Oil Based on ASME B16.5~~
~~285 @ 20/100~~
~~260 @ 200 CL 150~~
~~B16.5 0.0625 Carbon Steel 1/2" 1 1/2", XS~~
~~2" 4", STD Carbon Steel Carbon Steel Carbon Steel 13CR HFS 304 SS Spiral Wound /ASME~~
~~B16.20~~
~~C12E~~
~~(CE) NFPA 13~~
~~(WF) Fire Protection, Aboveground Based on Design~~
~~175 @ 120 CL 150~~
~~B16.5 0.1000 Carbon Steel.~~
~~3/4" 1", Sch. 160~~
~~1 1/2 2", XS 3" 20", STD Carbon Steel Malleable Iron Cast Bronze~~

~~Cast Iron Bronze~~
~~Ductile Iron Neoprene~~
~~C12U~~
~~(CU) ASME B31.3, Normal Fluid Service~~
~~(GK) Compressed Air, Underground~~
~~(GQ) Ditto Based on ASME B16.5~~
~~285 @ -20/100~~
~~200 @ 400 CL 150~~
~~B16.5 0.0625 Carbon Steel, Externally Coated~~
~~1/2" 1 1/2", XS~~
~~2" 24" STD Carbon Steel, Externally Coated Carbon Steel, Externally Coated Carbon Steel, Externally Coated~~
~~13CR-HF 304 SS Spiral Wound /ASME B16.20~~
~~C14A~~
~~(CK) ASME B31.3, Normal Fluid Service~~
~~(WF) River Water~~
~~(WP) Process Water Based on ASME B16.5~~
~~285 @ -20/100~~
~~200 @ 400 CL 150~~
~~B16.5 0.125 Carbon Steel~~
~~1/2" 2", XS~~
~~3" 24", STD Carbon Steel Carbon Steel Carbon Steel 13CR-HFS 304 SS Spiral Wound /ASME~~
~~B16.20~~
~~CK1M~~
~~(CM) ASME B31.3, Normal Fluid Service~~
~~(CH) High Pressure Air~~
~~(CN) High Pressure Nitrogen Based on Design~~
~~4,000 @ 200 CL 2500~~
~~B16.5 0.0312 Carbon Steel~~
~~1/2" 6", XXS Carbon Steel Carbon Steel Carbon Steel 13CR-HFS Soft Iron RTJ/ ASME B16.20~~
~~CK2N~~
~~(CN) ASME B31.3, Normal Fluid Service~~
~~(WQ) High Pressure Water, 3675 Psig Based on Design~~
~~3,675 @ 200 CL 2500~~
~~B16.5 0.0625 Carbon Steel~~
~~1/2" 6", XXS Carbon Steel Carbon Steel Carbon Steel 13CR-HFS Soft Iron RTJ/ ASME B16.20~~
~~F10A~~
~~(FA) ASME B31.3, Category M Fluid Service~~
~~Radioactive, Dangerous Liquid Effluent Line Based on Design~~
~~150 @ 200 CL 150~~
~~B16.5 0.000 Double Containment Fiberglass Reinforced Thermosetting Resin Double Contain-ment Fiberglass~~
~~Reinforced Thermosetting Resin Double Contain-ment Fiberglass Reinforced Thermo-setting Resin PVDF EPDM/~~
~~Viton EPDM/ Viton~~
~~G12A~~
~~(CW) Uniform Plumbing Code~~
~~(WV) Potable Water Based on Design~~
~~200 @ 150 CL 150~~
~~B16.5 0.050 Carbon Steel, Galvanized~~
~~1/2" 3", XS~~
~~4" 12", STD Ductile Iron, Galvanized Malleable Iron, Galvanized Cast Bronze/ Ductile Iron Bronze EPDM~~
~~H00A~~
~~(JB) Uniform Plumbing Code~~
~~(WV) Potable Water Based on Design~~
~~200 @ 150 TBD 0.000 Cement Mortar Lined Ductile Iron Pressure Pipe Cement Mortar Lined Ductile Iron~~
~~None None Synthetic Rubber~~

~~LE0A~~
~~(JA) NFPA 24~~
~~(WF) Fire Protection, Underground Based on Design~~
~~175 @ Ambient CL 125~~
~~B16.1 0.000 Cement Mortar Lined Ductile Iron Pressure Pipe Cement Mortar Lined Ductile Iron or Gray Iron~~
~~None Cast Iron Cast Iron/ Bronze Rubber or Neoprene~~
~~N11E~~
~~(TE) ASME B31.3, Category M Fluid Service~~
~~Highly Corrosive Process Fluids in High Active Cells Based on Design~~
~~110 @ 360 No Flanges 0.0312 Hastelloy C 276~~
~~1/2" 2", Sch. 40S~~
~~3" 8", Sch. 10S Hastelloy C 276 Hastelloy C 276 No Valves No Valves No Gaskets~~
~~N11F~~
~~(TF) ASME B31.3, Category M Fluid Service~~
~~(ZF) Plant Washings Based on Design~~
~~100 @ 200 TBD 0.0425 SS AL 6XN~~
~~(UNS N08367)~~
~~1/2" 4", Sch. 40S~~
~~6" 24", Sch 10S~~
~~30", Sch 10S SS AL 6XN~~
~~(UNS N08367) SS AL 6XN~~
~~(UNS N08367) TBD TBD TBD~~
~~N13A~~
~~ASME B31.3, Category M Fluid Service~~
~~TBD Based on Design~~
~~10 @ 600 TBD 0.093 Hastelloy C 22~~
~~(UNS N06022) Hastelloy C 22~~
~~(UNS N06022) TBD TBD TBD TBD~~
~~N31C~~
~~(TC) ASME B31.3, Category M Fluid Service~~
~~(TBD) In Cell Process Piping~~
~~(TBD) In Cell Caustic Lines Based on Design~~
~~20 @ 520 None 0.0312 Inconel 600~~
~~1/2" 2", Sch. 40S~~
~~3" 6", Sch. 10S Inconel 600 Inconel 600 No Valves No Valves No Gaskets~~
~~P10A~~
~~(PA) Uniform Plumbing Code~~
~~(WB) Potable Water, Underground Based on Design~~
~~200 @ 73~~
~~124 @ 100~~
~~80 @ 120 TBD 0.000 PVC~~
~~1" 2", Sch. 80~~
~~3" 12", Pressure Class 200 PVC PVC 1" 2", Bronze~~
~~3" 12", Cast Iron/ Internally Coated Bronze Synthetic Rubber/ ASTM F477~~
~~P10C~~
~~(PC) ASME B31.3, Category D Fluid Service~~
~~Underground Services:~~
~~(WE) Demineralized Water~~
~~(WR) River Water~~
~~(WB) Cooling Water Supply~~
~~(WC) Cooling Water Return~~
~~(ZA) Non Dangerous, Non Radioactive Liquid Effluent~~
~~(WK) Chilled Water Supply~~
~~(WL) Chilled Water Return Based on Design~~

~~150 @ 0/100 CL 150~~
~~B16.5 0.000 PVC~~
~~12" & Smaller, Sch. 80 PVC PVC PVC PVC/ Viton EPDM~~
~~P10E~~
~~(PE) ASME B31.3, Category D Fluid Service~~
~~(WY) Sewer Based on Design~~
~~150 @ 73~~
~~60 @ 120 CL 150~~
~~B16.5 0.000 PVC~~
~~12" & Smaller, Sch. 40 PVC PVC PVC PVC/ Viton Neoprene~~
~~P10F~~
~~(PF) ASME B31.3, Category D Fluid Service~~
~~(WY) Sanitary Sewer Tile Drain Gravity @ Ambient/120 CL 150~~
~~B16.5 0.000 PVC~~
~~4", SDR 35 PVC None None None Neoprene~~
~~S10A~~
~~(SA) ASME B31.3, Category Normal Fluid Service~~
~~(GL) Instrument Air Based on ASME B16.5~~
~~230 @ -20/100~~
~~195 @ 200 CL 150~~
~~B16.5 0.000 304L SS~~
~~1/2" - 2", Sch. 40S~~
~~3" - 24", Sch. 10S 304L SS 304L SS 304L SS 316SS HFS 316 SS Spiral Wound /ASME B16.20~~
~~S11B~~
~~(SB)~~
~~ASME B31.3, Category M Fluid Service~~
~~In-Cell Piping with < 2% Solids (Process, Services, Reagents, and Vessel Vents) Based on ASME B16.5, Class 150~~
~~230 @ -20/100~~
~~166 @ 360~~
~~No Flanges 0.0312 316L SS~~
~~1/2" - 2", Sch. 40S~~
~~3" - 24", Sch. 10S 316L SS 316LSS TBD TBD None~~
~~S11C~~
~~(SC) ASME B31.3, Category Normal Fluid Service~~
~~(ZS) Process Radioactive Condensate~~
~~(ZR) Suspect Radioactive Condensate~~
~~(WG) Re-circulated Emergency Cooling Suspect Radioactive~~
~~(WS) Recirculated Cooling Suspect Radioactive~~
~~(WE) Demineralized Water~~
~~(WD) Inhibited Water~~
~~(ZB) Biocides~~
~~(ZC) Corrosion Inhibitors Based on ASME B16.5~~
~~230 @ -20/100~~
~~166 @ 360 CL 150~~
~~B16.5 0.0312 316L SS~~
~~1/2" - 2", Sch. 40S~~
~~3" - 14", Sch. 10S~~
~~16" - 20, 0.250" nom.~~
~~24" 0.312" nom. 316L SS 316L SS 316L SS 316SS HFS 316 SS Spiral Wound /ASME B16.20~~
~~S11F~~
~~(SF) ASME B31.3, Category M Fluid Service~~
~~In-Cell Piping with < 2% Solids (Process, Services, Reagents, and Vessel Vents that Contain Nitric Acid) Based on ASME~~
~~B16.5 , Class 150~~
~~230 @ -20/100~~

~~166 @ 360~~
~~No Flanges 0.0312 304L SS~~
~~1/2" 2", Sch. 40S~~
~~3" 24", Sch. 10S 304L SS 304L SS TBD TBD None~~
~~S11G~~
~~(SG) ASME B31.3, Category Normal Fluid Service~~
~~(XL) Lubricating Oil~~
~~(XH) Hydraulic Oil~~
~~(XJ) Transformer Oil Based on ASME B16.5~~
~~230 @ 20/100~~
~~195 @ 200 CL 150~~
~~B16.5 0.0312 304L SS~~
~~1/2" 2", Sch. 40S~~
~~3" 10", Sch 10S 304L SS 304L SS 304L SS 316SS HFS 316 SS Spiral Wound /ASME B16.20~~
~~S11K~~
~~(SK) ASME B31.3, Category Norm Fluid Service~~
~~(GM) Ammonia~~
~~(RC) Calcium Nitrate~~
~~(RL) Potassium Permanganate~~
~~(RK) Sodium Permanganate~~
~~(RQ) 1M Strontium Nitrite~~
~~(PV) Strontium Carbonate~~
~~Ammonium Hydroxide~~
~~(RN) 0.5M Sodium Nitrite~~
~~(JS) 0.5M Sodium Hydroxide~~
~~(JS) 5M Sodium Hydroxide~~
~~(ZK) Fresh Ion Exchange [IX] Resin~~
~~(ZM) Off-Specification Resin Based on ASME B16.5~~
~~230 @ 20/100 CL 150~~
~~B16.5 0.0312 304L SS~~
~~1/2" 2", Sch. 40S~~
~~3" 14", Sch. 10S~~
~~16" 20", 0.250" nom.~~
~~24", 0.312" nom. 304L SS 304L SS 304L SS 316L SS HFS 316 SS Spiral Wound /ASME B16.20~~
~~S11M~~
~~(SM) ASME B31.3, Category M Fluid Service~~
~~(GV) Radioactive Vessel Vent~~
~~(PW) Radioactive Gas/Vapor~~
~~(ZE) Plant Wash Solvent~~
~~(ZF) Plant Washings~~
~~(ZH) Acidic Effluents~~
~~(ZJ) Alkaline Effluents~~
~~(ZL) Spent Ion Exchange Resin~~
~~(ZN) Neutralized Effluent~~
~~(ZY) Scrubber Effluent Based on ASME B16.5~~
~~230 @ 20/100 CL 150~~
~~B16.5 0.0312 316L SS~~
~~1/2" 2", Sch. 40S~~
~~3" 24", Sch. 10S 316L SS 316L SS 316L SS 316L SS HFS 316 SS Spiral Wound /ASME B16.20~~
~~S11P~~
~~(TB) ASME B31.3, Category M Fluid Service~~
~~(ZT) Thermocouple Sheathed Line In Cell Based on ASME B16.5~~
~~230 @ 20/100 None 0.0312 316L SS~~

~~1/2" 3/4", Sch. 10S None No fitting, Use Type 316L Jointing Sleeve No Valves No Valves No Gaskets~~
~~S11R~~
~~(SR) ASME B31.3, Category Norm Fluid Service~~
~~(HN) 0.5M Nitric Acid~~
~~(HN) 2M Nitric Acid~~
~~(HN) 5M Nitric Acid~~
~~(HN) 12.2M Nitric Acid~~
~~(HR) Recovered Nitric Acid~~
~~(HT) Citric Acid (SDG3)~~
~~(GU) Nitric Acid Fume Based on ASME B16.5~~
~~230 @ 20/100 CL 150~~
~~B16.5 0.0312 304L SS~~
~~1/2" 2", Sch. 40S~~
~~3" 14", Sch 10S~~
~~16" 20", 0.250" nom.~~
~~24", 0312" nom. 304L SS 304L SS 304L SS 304L SS HFS 304SS Spiral Wound /ASME B16.20~~
~~S11Y~~
~~(SY) ASME B31.3, Category M Fluid Service~~
~~(ZG) Pneumercator Line~~
~~(ZP) Pneumatic Sample Line~~
~~(ZQ) Pneumatic Service Line Based on ASME B16.5~~
~~230 @ 20/100 TBD 0.0312 316L SS~~
~~1/2" 3/4", Sch. 40S None 316L SS No Valves No Valves No Gaskets~~
~~S12A~~
~~(LB) ASME B31.3, Category M Fluid Service~~
~~In-Cell Piping with ≥2% solids (Process, Services, Reagents, and Vessel Vents) Based on ASME B16.5, Class 150~~
~~230 @ 20/100~~
~~166 @ 360~~
~~No Flanges 0.0625 316L SS~~
~~1/2" 2", Sch. 40S~~
~~3" 14", Sch. 10S~~
~~16" 24", 0250" nom. 316L SS 316L SS TBD TBD None~~
~~S12C~~
~~(LE)~~
~~(>2% solids) ASME B31.3, Category M Fluid Service~~
~~(PA) Radioactive Aqueous~~
~~(PX) Radioactive Slurry Based on ASME B16.5~~
~~230 @ 20/100 CL 150~~
~~B16.5 0.0625 316L SS~~
~~1/2" 2", Sch. 40S~~
~~3" 14", Sch. 10S~~
~~16" 24", 0.250" nom. 316L SS 316L SS 316L SS 316L SS 316 SS Spiral Wound /ASME B16.20~~
~~S12D~~
~~(LF) ASME B31.3, Category M Fluid Service~~
~~In-Cell Piping with ≥ 2% Solids (Process, Services, Reagents, and Vessel Vents that Contain Nitric Acid) Based on ASME B16.5, Class 150~~
~~230 @ 20/100~~
~~166 @ 360 No Flanges 0.0625 304L SS~~
~~1/2" 2", Sch. 40S~~
~~3" 14", Sch. 10S~~
~~16" 24", 0.250" nom. 304L SS 304L SS TBD TBD None~~
~~S14D~~
~~(TD) ASME B31.3, Category M Fluid Service~~

~~(FX) Mixed Glass Former~~

~~Solids-high erosion Based on ASME B16.5~~

~~230 @ 20/100~~

~~195 @ 200 CL 150~~

~~B16.5 0.125 316L SS~~

~~1/2" 1", Sch. 160~~

~~1-1/2" 2", Sch. 80S~~

~~3" 12", Sch. 40S 316L SS316L SS316L SS316L SS HFS 316 SS Spiral Wound /ASME B16.20~~

~~S30J~~

~~(SJ) ASME B31.3, Normal Fluid Service~~

~~Liquid Carbon Dioxide Based on Design~~

~~300 @ 50 , CL 300~~

~~B16.5 0.000 304L SS~~

~~1/2" 2", Sch. 40S~~

~~3" 12, Sch. 10S 304L SS304L SS304L SS (Later) 316 SS Spiral Wound /ASME B16.20~~

~~S31H~~

~~(SH)~~

~~ASME B31.3, Category M Fluid Service~~

~~<2% Solids In-Cell Piping (Process and Vessel Vents) Based on ASME B16.5~~

~~600 @ 20/100~~

~~505 @ 200 CL 300~~

~~B16.5 0.0312 316L SS~~

~~1/2" 12", Sch. 40S 316L SS316L SS TBD TBD None~~

~~S31T~~

~~(ST) ASME B31.3, Category M Fluid Service~~

~~Service Bulges, Process Bulges, Cabinets Based on Design~~

~~385 @ 400 CL 300~~

~~B16.5 0.0312 316L SS~~

~~1/2" 12", Sch. 40S 316L SS316L SS316L SS316L SS HFS 316 SS Spiral Wound /ASME B16.20~~

~~S31U~~

~~(SU)~~

~~ASME B31.3, Category M Fluid Service~~

~~< 2% Solids In-Cell Piping (Process, and Vessel Vents that Contain Nitric Acid)) Based on ASME B16.5~~

~~600 @ 20/100~~

~~505 @ 200 CL 300~~

~~B16.5 0.0312 304L SS~~

~~1/2" 12", Sch. 40S 304L SS304L SS TBD TBD None~~

~~S32A~~

~~(LH) ASME B31.3, Category M Fluid Service~~

~~≥ 2% Solids In-Cell Piping (Process and Vessel Vents) Based on ASME B16.5~~

~~600 @ 20/100~~

~~505 @ 200 CL 300~~

~~B16.5 0.0625 316L SS~~

~~1/2" 12", Sch. 40S~~

~~14", 0.375" nom.~~

~~16" 18", 0.437" nom.~~

~~20", 0.500" nom.~~

~~24", 0.562" nom. 316L SS316L SS TBD TBD None~~

~~S32B~~

~~(LW)~~

~~(≥ 2% Solids) (PE) Entrained Solids Concentrate;~~

~~(PJ) HLW Melter Feed;~~

~~(PC) HLW Feed Slurry Double Containment Pipe~~

~~INNER~~

~~PIPE ASME B31.3, Category M Fluid Service Based on Design~~
~~400 @ 160 TBD 0.0625 316L SS~~
~~1/2" 4", Sch. 40S None Use Bends for Directional Change No Valves No Valves None~~
~~OUTER~~
~~PIPE ASME B31.3, Category D Service Fluid TBD TBD 0.0000 316L SS~~
~~4" 8", Sch. 10S Not Permitted Except Where Fitting Radius Equals Bend Radius No Valves No Valves~~
~~None~~
~~S62A~~
~~(LU) ASME B31.3, Category M Fluid Service~~
~~≥ 2% Solids In-Cell Piping (Process and Vessel Vents that Contain Nitric Acid) Based on ASME B16.5~~
~~600 @ -20/100~~
~~505 @ 200 CL 300~~
~~B16.5 0.0625 304L SS~~
~~1/2" 12", Sch. 40S~~
~~14", 0.375" nom.~~
~~16" 18", 0.437" nom.~~
~~20", 0.500" nom.~~
~~24", 0.562" nom. 304L SS 304L SS TBD TBD None~~
~~SJ0E~~
~~(SE) ASME B31.3, Category Normal Fluid Service~~
~~(GL) Instrument Air Back Up Based on ASME B16.5~~
~~3000 @ -20/100~~
~~2530 @ 200 CL 1500~~
~~B16.5 0.000 304L SS~~
~~1/2" 1", Sch. 80S~~
~~1 1/2", 0.250" nom 2", 0.312" nom.~~
~~3", 0.437" nom. 304L SS 304L SS 304L SS 316SS HFS Soft Iron RTJ/ ASME B16.20~~
~~T11A~~
~~(ZA) ASME B31.3, Category M Fluid Service~~
~~(HC) Cerium De-contaminant~~
~~(ZX) Special De-contaminant Based on Design~~
~~120 @ 360 None 0.0312 Titanium~~
~~(ASTM B337 Gr. 2)~~
~~1/2" 2", Sch. 40S~~
~~3" 6", Sch. 10S Titanium Titanium No Valves No Valves None~~
~~W31A~~
~~(WA)~~
~~(< 2% Solids)~~
~~Radioactive Effluent (LA Effluents/Process Fluids)~~
~~(PF) Cs/Tc Concentrate/ Intermediate Product Double Containment Pipe~~
~~INNER~~
~~PIPE ASME B31.3, Category M Fluid Service Based on Design~~
~~400 @ 160 TBD 0.0312 316L SS~~
~~1/2" 2", Sch. 40S~~
~~3" 4", Sch. 10S None Use Bends for Directional Change No Valves No Valves None~~
~~OUTER~~
~~PIPE ASME B31.3, Category D Service Fluid TBD TBD 0.0000 316L SS~~
~~4" 8", Sch. 10S Not Permitted Except Where Elbow Radius Equals Bend Radius No Valves No Valves~~
~~None~~
~~W62F~~
~~(XA) DST Transfer Line Double Containment Pipe~~
~~INNER~~
~~PIPE ASME B31.3, Category M Fluid Service Based on Design~~
~~1000 @ 160 None 0.0625 304L SS~~

~~1/2" 4", Sch. 80S None Use Bends for Directional Change No Valves No Valves None~~
~~OUTER~~
~~PIPE ASME B31.3, Category D Fluid Service TBD TBD 0.0000 Carbon Steel, A106 B, Smls~~
~~4" 8", STD Not Permitted Except Where CS Fitting Radius Equals Bend Radius No Valves No Valves~~
~~None~~

Table 4-2 Container Storage Areas Summary

Container Storage Area	Maximum Waste Volume (US Gallons) [1]	Approximate Dimensions (L × W × H, in feet) [2]
HLW Vitrification Plant		
IHLW Canister ~~Storage~~Storage ~~Area~~Cave (H-0132)	~~245,504~~162,589	~~(67 × 23 × 27) + (67 × 34 ×27)~~63 × 23 × 15
HLW ~~Container Storage Area No. 1~~East Corridor El. 0' (HC-0108/09/10)	~~266,654~~310,291	122 × 34 ×~~37~~ 10
HLW ~~Container Storage Area No. 2~~Loading Area (H-0130) ~~HLW Container Storage Area No. 3~~	~~71,999~~159,185 ~~43,392~~	56 × ~~20~~ 38 × ~~27~~10 ~~45 × 15 × 37~~
Analytical Laboratory		
Laboratory Waste Management Area (A-0139 and A-0139A)	119,613	41 × 39 × 10
Other Areas		
~~Central Waste Storage Facility~~ Non-Radioactive Dangerous Waste Container Storage Area	~~617,137~~ ~~48,214~~56,104	~~80 × 120 × 10~~ 25 × 30 × 10
~~HLW~~ Failed Melter ~~Out-Of-Service~~ Storage ~~Area~~ Facility ~~LAW Melter Out-Of-Service Storage Area~~	~~202,498~~403,947 ~~216,962~~	~~70~~75 × 45 × ~~35~~16 ~~45 × 75 × 35~~

1 The conversion factor used to convert from cubic feet to gallons is 7.4805 gal/ft^3

2 The dimension for height (H) is based on the height of the largest waste container stored in the area (i.e., LAW container is 7.5 ft, HLW canister is 15 ft, melters are assumed to be 16 ft, and a B-25 box is 5 ft - stacked a maximum of two high is 10 ft).

Table 4-3 Pretreatment Plant Tank Systems

No.	System	Vessel Number	Description	Material of Construction	~~Maximum~~ Total Volume (US ~~g~~Gallons)	Approximate Dimensions (Diameter ~~[D]~~ × Height or/ Length ~~[H/L]~~ in ~~inches~~feet)
1	FRP	~~V11020A~~FRP-VSL-00002 A	Waste Feed Receipt Vessel	Stainless Steel	~~388,000~~474,000	~~552 × 468~~47 × 26.75
2	FRP	~~V11020B~~FRP-VSL-00002 B	Waste Feed Receipt Vessel	Stainless Steel	~~388,000~~474,000	~~552 × 468~~47 × 26.75
3	FRP	~~V11020C~~FRP-VSL-00002 C	Waste Feed Receipt Vessel	Stainless Steel	~~388,000~~474,000	~~552 × 468~~47 × 26.75
4	FRP	~~V11020D~~FRP-VSL-00002 D	Waste Feed Receipt Vessel	Stainless Steel	~~388,000~~474,000	~~552 × 468~~47 × 26.75
5	FEP	~~V11001A~~FEP-VSL-00017 A	Waste Feed Evaporator Feed Vessel	Stainless Steel	~~59,070~~85,557	~~264 × 336~~22 × 22.75
6	FEP ~~FEP~~ ~~FEP~~	~~V11001B~~FEP-VSL-00017 B ~~V11002A~~ ~~V11002B~~	Waste Feed Evaporator Feed Vessel ~~Waste Feed Evaporator Separator Vessel~~ ~~Waste Feed Evaporator Separator Vessel~~	Stainless Steel ~~Stainless Steel~~ ~~Stainless Steel~~	~~59,070~~85,557 ~~21,240~~ ~~21,240~~	~~264 × 336~~22 × 22.75 ~~132 × 402~~ ~~132 × 402~~
7	FEP	~~V11005~~FEP-VSL-00005	LAW Feed Evaporator ~~Process~~ Condensate ~~Pot~~Vessel	Stainless Steel	~~1,190~~5,022	~~60 × 116~~8 × 10.75
8	UFP	~~V12015A~~UFP-VSL-00062 A	~~LAW~~ Ultrafilter Permeate ~~Hold~~ Vessel	Stainless Steel	~~28,390~~34,700	~~180 × 317~~15 × 21.25
9	UFP	~~V12015B~~UFP-VSL-00062 B	Ultrafilter Permeate Vessel~~LAW Permeate Hold Vessel~~	Stainless Steel	~~28,390~~34,700	~~180 × 317~~15 × 21.25
10	UFP	~~V12015C~~UFP-VSL-00062 C	Ultrafilter Permeate Vessel~~LAW Permeate Hold Vessel~~	Stainless Steel	~~28,390~~34,700	~~180 × 317~~15 × 21.25
11	UFP	~~V12010A~~UFP-VSL-00001 A	Ultrafiltration Feed Preparation ~~Evaporator Concentrate Buffer~~ Vessel	Stainless Steel	~~62,340~~75,593	~~240 × 397~~20 × 25.5
12	UFP	~~V12010B~~UFP-VSL-00001 B	Ultrafiltration Feed Preparation Vessel~~Evaporator Concentrate Buffer Vessel~~	Stainless Steel	~~62,340~~75,593	~~240 × 397~~20 × 25.5

Table 4-3 **Pretreatment Plant Tank Systems**

No.	System	Vessel Number	Description	Material of Construction	~~Maximum~~ Total Volume (US ~~g~~Gallons)	Approximate Dimensions (Diameter ~~[D]~~ × Height or~~/~~ Length ~~[H/L]~~ in ~~inches~~feet)
13	UFP	~~V12011A~~UFP-VSL-00002 A	Ultrafiltration Feed Vessel	Stainless Steel	~~26,840~~40,783	~~168 × 335~~14 × 30.75
14	UFP	~~V12011B~~UFP-VSL-00002 B	Ultrafiltration Feed Vessel	Stainless Steel	~~26,840~~40,783	~~168 × 335~~14 × 30.75
15	UFP	~~G12002A~~UFP-FILT-00001 A	Ultrafilter	Stainless Steel	140	~~17 × 145~~1.5 × 12
16	UFP	~~G12002B~~UFP-FILT-00001 B	Ultrafilter	Stainless Steel	140	~~17 × 145~~1.5 × 12
17	UFP	~~G12003A~~UFP-FILT-00002 A	Ultrafilter	Stainless Steel	140	~~17 × 145~~1.5 × 12
18	UFP	~~G12003B~~UFP-FILT-00002 B	Ultrafilter	Stainless Steel	140	~~17 × 145~~1.5 × 12
19	UFP	~~G12004A~~UFP-FILT-00003 A	Ultrafilter	Stainless Steel	140	~~17 × 145~~1.5 × 12
20	UFP	~~G12004B~~UFP-FILT-00003 B	Ultrafilter	Stainless Steel	140	~~17 × 145~~1.5 × 12
21	HLP	~~V12007~~HLP-VSL-00028	HLW Feed Blending Vessel	Stainless Steel	~~18,070~~142,200	~~144 × 304~~26.5 × 29
22	HLP	~~V12001A~~HLP-VSL-00027 A	~~Strontium/transuranic~~HLW Lag Storage Vessel	Stainless Steel	~~96,900~~127,260	~~300 × 415~~25 × 29.5
23	HLP ~~HLP~~	~~V12001C~~HLP-VSL-00027 B ~~V12001D~~	HLW Lag Storage Vessel~~Strontium/transuranic Lag Storage Vessel~~ ~~Lag Storage Vessel~~	Stainless Steel ~~Stainless Steel~~	~~96,900~~172,260 ~~96,900~~	~~300 × 415~~25 × 29.5 ~~300 × 415~~
24	HLP	HLP-VSL-00022~~V12001E~~	HLW Feed Receipt Vessel~~Lag Storage Vessel~~	Stainless Steel	~~96,900~~270,600	~~300 × 415~~38 × 24.25
25	CXP	~~C13001~~CXP-IXC-00001	Cesium Ion Exchange Column	Stainless Steel	680	~~42 × 126~~3.5 × 10.5
26	CXP	CXP-IXC-00002~~C13002~~	Cesium Ion Exchange Column	Stainless Steel	680	3.5 × 10.5~~42 × 126~~
27	CXP	CXP-IXC-00003~~C13003~~	Cesium Ion Exchange Column	Stainless Steel	680	3.5 × 10.5~~42 × 126~~

Table 4-3 **Pretreatment Plant Tank Systems**

No.	System	Vessel Number	Description	Material of Construction	~~Maximum~~ Total Volume (US gGallons)	Approximate Dimensions (Diameter ~~[D]~~ × Height or~~/~~ Length ~~[H/L]~~ in ~~inches~~feet)
28	CXP	CXP-IXC-00004~~C13004~~	Cesium Ion Exchange Column	Stainless Steel	680	3.5 × 10.5~~42 × 126~~
29	CXP	~~V13001~~CXP-VSL-00001	~~LAW~~ Cesium Ion Exchange Feed Vessel	Stainless Steel	~~61,200~~103,350	~~228 × 421~~23 × 28.5
30	CXP	~~V13008~~CXP-VSL-00004	Cesium Ion Exchange Caustic Rinse Collection Vessel	Stainless Steel	~~2,400~~11,085	~~78 × 142~~10.5 × 14.25
31	CXP	CXP-VSL-00005	Cesium Reagent Vessel	Stainless Steel	1,180	5 × 9
32	CXP	CXP-VSL-00026A	Cesium Ion Exchange Treated LAW Collection Vessel	Stainless Steel	36,480	15 × 24.5
33	CXP	CXP-VSL-00026B	Cesium Ion Exchange Treated LAW Collection Vessel	Stainless Steel	36,480	15 × 24.5
34	CXP	CXP-VSL-00026C	Cesium Ion Exchange Treated LAW Collection Vessel	Stainless Steel	36,480	15 × 24.5
35	CNP	~~V13073~~CNP-VSL-00003	Eluate Contingency Storage Vessel	Stainless Steel	~~11,060~~23,200	~~138 × 216~~14 × 17.25
36	CNP ~~CNP~~ ~~TXP~~ ~~TXP~~ ~~TXP~~ ~~TXP~~ ~~TXP~~ ~~TXP~~	~~V13028~~CNP-VSL-00004 ~~V13030~~ ~~V43001~~ ~~C43006~~ ~~C43007~~ ~~C43008~~ ~~C43009~~ ~~V43056~~	Cesium Evaporator Recovered Nitric Acid Vessel ~~Cesium Concentrate Lute Pot~~ ~~Technetium Ion Exchange Buffer Vessel~~ ~~Technetium Ion Exchange Column~~ ~~Technetium Ion Exchange Column~~ ~~Technetium Ion Exchange Column~~ ~~Technetium Ion Exchange Column~~ ~~Caustic Rinse Collection Vessel~~	Stainless Steel ~~Stainless Steel~~ ~~Stainless Steel~~ ~~Stainless Steel~~ ~~Stainless Steel~~ ~~Stainless Steel~~ ~~Stainless Steel~~ ~~Stainless Steel~~	~~5,410~~11,115 ~~70~~ ~~18,100~~ ~~680~~ ~~680~~ ~~680~~ ~~680~~ ~~3,300~~	~~96 × 204~~9.5 × 19 ~~17 × 36~~ ~~156 × 270~~ ~~42 × 126~~ ~~42 × 126~~ ~~42 × 126~~ ~~42 × 126~~ ~~96 × 137~~
37	CNP	CNP-VSL-00001	Cesium Evaporator Eluant Lute Pot	Stainless Steel	109	4 × 3
38	TLP	TLP-VSL-00002	Treated LAW Evaporator Condensate Vessel	Stainless Steel	2,300	6 × 9
39	TLP	~~V45009A~~TLP-VSL-00009A	LAW ~~Plant Wash~~ SBS Condensate Receipt Vessel	Stainless Steel	~~88,920~~130,010	~~264 × 462~~26 × 27.25
40	TLP	TLP-VSL-00009B~~V45009B~~	LAW SBS Condensate Receipt Vessel~~Plant Wash Vessel~~	Stainless Steel	~~88,920~~130,010	~~264 × 462~~26 × 27.25

Table 4-3 Pretreatment Plant Tank Systems

No.	System	Vessel Number	Description	Material of Construction	~~Maximum~~ Total Volume (US gGallons)	Approximate Dimensions (Diameter ~~[D]~~ × Height or~~/~~ Length ~~[H/L]~~ in ~~inches~~feet)
41	TCP	~~V41001~~TCP-VSL-00001	Treated LAW Concentrate ~~Buffer~~ Storage Vessel	Stainless Steel	~~117,000~~146,740	~~312 × 456~~26.5 × 30.25
42	RDP	~~V43135A~~RDP-VSL-00002A	Spent Resin ~~Collection~~ Slurry Vessel	Stainless Steel	~~8,720~~15,240	~~118 × 196~~12 × 14
43	RDP	RDP-VSL-00002B~~V43135B~~	Spent Resin ~~Collection~~ Slurry Vessel	Stainless Steel	~~8,720~~15,240	~~118 × 196~~12 × 14
44	RDP	RDP-VSL-00002C~~V43136~~	Spent Resin ~~Flush Collection~~ Slurry Vessel	Stainless Steel	~~11,220~~15,240	~~144 × 206~~12 × 14
45	RDP	RDP-VSL-00004	Spent Resin Dewatering Moisture Separation Vessel	Stainless Steel	TBD	TBD
46	RLD	~~V45028A~~RLD-TK-00006A	Process Condensate ~~Vessel~~Tank	Stainless Steel	~~321,720~~394,000	~~480 × 492~~40 × 45
47	RLD	RLD-TK-00006B~~V45028B~~	Process Condensate ~~Vessel~~Tank	Stainless Steel	~~321,720~~394,000	~~480 × 492~~40 × 45
48	RLD	RLD-VSL-00017A	Alkaline Effluent Vessel	Stainless Steel	~~42,950~~34,340	16 × ~~23.25~~17.5
49	RLD	RLD-VSL-00017B	Alkaline Effluent Vessel	Stainless Steel	~~42,950~~34,340	16 × ~~23.25~~17.5
50	PWD	~~V15009B~~PWD-VSL-00033	Ultimate Overflow Vessel	~~Stainless Steel~~316L	~~23,000~~41,650	~~216 × 216~~24 × 7.5
51	PWD	~~V12002~~PWD-VSL-00043	HLW Effluent Transfer Vessel	316L ~~Stainless Steel~~	~~23,000~~41,650	~~216 × 216~~24 × 7.5
52	PWD	PWD-VSL-00015~~V15013~~	Acid/Alkaline Effluent Vessel	Stainless Steel	~~93,180~~119,150	~~264 × 480~~22 × 34.5
53	PWD	PWD-VSL-00044~~V15009A~~	Plant Wash Vessel	Stainless Steel	~~73,860~~103,024	~~456 × 240~~23 × 25.5
54	PWD	PWD-VSL-00046~~V15319~~	C3 Floor Drains Collection ~~Tank~~Vessel	316L ~~Stainless Steel~~	~~450~~4,982	~~36 × 72~~8 × 10.5
55	PWD ~~PVP~~ ~~PVP~~	~~V15018~~PWD-VSL-00016 ~~PVPVSL00003V15052~~ ~~V15038~~	Acid/Alkaline Effluent Vessel ~~Vessel Vent Header Collection Vessel~~ ~~Condensate Collection Vessel~~	Stainless Steel ~~Stainless Steel~~ ~~Stainless Steel~~	~~93,180~~119,150 ~~900~~ ~~1,230~~	~~264 × 480~~22 × 34.5 ~~54 × 108~~ ~~60 × 120~~
56	~~PVP~~PJV	PJV-VSL-00002~~V15327~~	PJV HEME Drain Collection Vessel	Stainless Steel	~~2,760~~8,975	~~72 × 180~~10 × 12
57	PVP	PVP-VSL-00001	Vessel Ventilation HEME Drain Collection Vessel	Stainless Steel	~~820~~1,969	6 × 7.25

Table 4-3 Pretreatment Plant Tank Systems

No.	System	Vessel Number	Description	Material of Construction	~~Maximum~~ Total Volume (US ~~g~~Gallons)	Approximate Dimensions (Diameter ~~[D]~~ × Height or~~/~~ Length ~~[H/L]~~ in ~~inches~~feet)
58	SHR~~PVP~~	~~V15326~~SHR-TK-00009	~~HEME Drain Collection Vessel~~Feed Line Flush Tank	Stainless Steel	~~820~~14,900	~~48 × 120~~15 × 13.75
59	PIH	PIH-TK-00001	Decontamination Soak Tank	Stainless Steel	TBD	TBD

Table 4-4 LAW Vitrification Plant Tank Systems

No.	System	Vessel Number	Description	Material	~~Maximum~~ Total Volume (US ~~G~~gallons)	Approximate Dimensions (~~[~~Diameter ~~(D)~~ × Height ~~/~~ or Length ~~(H/L)~~ in feet~~]~~)
1	LCP	~~V21001~~LCP-VSL-00001	Melter 1 Concentrate Receipt Vessel	Stainless Steel	~~14,392~~18,130	~~13 × 17~~14 × 12.75
2	LCP ~~LCP~~	~~V21002~~LCP-VSL-00002 ~~V21003~~	Melter 2 Concentrate Receipt Vessel ~~Melter 3 Concentrate Receipt Vessel~~	Stainless Steel ~~Stainless Steel~~	~~14,392~~18,130 ~~14,392~~	~~13 × 17~~14 × 12.75 ~~13 × 17~~
3	LFP	~~V21101~~LFP-VSL-00001	Melter 1 Feed Preparation Vessel	Stainless Steel	~~6,221~~9,123	~~10 × 12~~11 × 10.5
4	LFP	~~V21102~~LFP-VSL-00002	Melter 1 Feed Vessel	Stainless Steel	~~6,221~~9,123	~~10 × 12~~11 × 10.5
5	LFP	~~V21201~~LFP-VSL-00003	Melter 2 Feed Preparation Vessel	Stainless Steel	~~6,221~~9,123	~~10 × 12~~11 × 10.5
6	LFP ~~LFP~~ ~~LFP~~	~~V21202~~LFP-VSL-00004 ~~V21301~~ ~~V21302~~	Melter 2 Feed Vessel ~~Melter 3 Feed Preparation Vessel~~ ~~Melter 3 Feed Vessel~~	Stainless Steel ~~Stainless Steel~~ ~~Stainless Steel~~	~~6,221~~9,123 ~~6,221~~ ~~6,221~~	~~10 × 12~~11 × 10.5 ~~10 × 12~~ ~~10 × 12~~
7	LVP	~~V22001~~LVP-TK-00001	LAW Caustic ~~Scrubber Blowdown Vessel~~Collection Tank	Stainless Steel	~~12,191~~14,579	~~14 × 14~~14.3 × 13
8	LOP	~~V22101~~LOP-VSL-00001	Melter 1 SBS Condensate Vessel	Hastelloy	~~6,833~~9,056	~~8 × 20~~12 × 8.2
9	LOP ~~LOP~~	~~V22201~~LOP-VSL-00002 ~~V22301~~	Melter 2 SBS Condensate Vessel ~~Melter 3 SBS Condensate Vessel~~	Hastelloy ~~Hastelloy~~	~~6,833~~9,056 ~~6,833~~	~~8 × 20~~12 × 8.2 ~~8 × 20~~
10	RLD	~~V25001~~RLD-VSL-00003	Plant Wash Vessel	Stainless Steel	~~25,130~~25,780	~~14 × 26~~16 × 14.6
11	RLD	~~V25002~~RLD-VSL-00004	LAW C3/C5 ~~Effluent~~ Drains/Sump Collection Vessel	Stainless Steel	~~7,218~~7,696	~~10 × 13~~10 × 11
12	RLD	~~V25003~~RLD-VSL-00005	SBS Condensate Collection Vessel	Stainless Steel	~~24,704~~25,780	~~16 × 18~~16 × 14.6

Table 4-5 HLW Vitrification Plant Tank Systems

No.	System	Vessel Number	Description	Material	~~Maximum~~ Total Volume (US ~~G~~gallons)	Approximate Dimensions (Diameter ~~[D]~~ × Height / in Length ~~[H/L]~~ in feet)
1	HCP	~~V31001~~HCP-VSL-00001	Concentrate Receipt Vessel 1	Stainless Steel	~~17,900~~~~20,061~~20,229	14 × 18
2	HCP	~~V31002~~HCP-VSL-00002	Concentrate Receipt Vessel 2	Stainless Steel	~~17,900~~~~20,061~~20,229	14 × 18
3	HOP	~~V32101~~HOP-VSL-00903	SBS Condensate ~~Collection~~ Receiver Vessel No. 1	Hastelloy	~~10,000~~~~9,941~~9,891	12 × 14
4	HOP	HOP-VSL-00904	SBS Condensate Receiver Vessel No. 2	Hastelloy	~~,94~~9,891	12 × 14
5	HDH	~~V33004~~HDH-VSL-00001	Canister Rinse Bogie Decon~~tamination~~ Vessel	Stainless Steel	~~2,500~~~~3,306~~3,314	~~5 × 17~~6 × 17
6	HDH	~~V33002~~HDH-VSL-00003	Waste Neutralization Vessel	Titanium	~~5,300~~~~5,326~~5,274	~~7 × 20~~7 × 17
7	HDH	HDH-VSL-00002~~V33001~~	Melter 1 Canister Decon~~tamination~~ Vessel	Titanium	~~580~~642	3 × 16
8	HDH	HDH-VSL-00004	Melter 2 Canister Decon Vessel	Titanium	642	3 × 16
9	RLD	~~V35002~~RLD-VSL-00007	Acidic Waste Vessel	Stainless Steel	~~16,700~~18,145	13 × 19
10	RLD ~~RLD~~	RLD-VSL-00008~~V35003~~ ~~V35009~~	Plant Wash and Drains Vessel ~~Decontamination Effluent Collection Vessel~~	Stainless Steel ~~Stainless Steel~~	~~13,200~~13,774 ~~7,300~~	13 × 16 ~~10 × 14~~
11	RLD	~~V35038~~RLD-VSL-00002	Off-gas Drains Collection Vessel	Stainless Steel	~~280~~~~344~~366	4 × 4
12	HFP	~~V31101~~HFP-VSL-00001	Feed Preparation Vessel	Stainless Steel	~~8,800~~8,445	~~8 × 11~~11 × 9.5
13	HFP	HFP-VSL-00002~~V31102~~	HLW Melter Feed Vessel	Stainless Steel	~~8,800~~8,445	~~8 × 11~~11 × 9.5
14	HFP	HFP-VSL-00005	Feed Preparation Vessel	Stainless Steel	8,445	11 × 9.5
15	HFP	HFP-VSL-00006	HLW Melter Feed Vessel	Stainless Steel	8,445	11 × 9.5
16	HSH	HSH-TK-00001	Decontamination Tank Melter Cave 1	Stainless Steel	3,718	23 × 6.7
17	HSH	HSH-TK-00002	Decontamination Tank Melter Cave 2	Stainless Steel	3,718	23 × 6.7

Table 4-6 Analytical Laboratory Tank Systems

No.	System	Vessel Number	Description	Material	~~Maximum~~ Total Volume (US ~~G~~gallons)	Approximate Dimensions (Diameter ~~[D]~~ × Height or ~~/~~Length ~~[H/L]~~ in feet)
1	LAB	RLD-VSL-00164~~V60001a~~	~~Lab Liquid Effluent~~ Laboratory Area Sink Drain Collection Vessel	Stainless Steel	~~12,0633,180~~3,200	~~11 × 14~~8.5 × 8.75
2	LAB	~~V60001b~~RLD-VSL-00165	~~Lab Liquid Effluent~~ Hot Cell Drain Collection Vessel	Stainless Steel	~~12,063~~9,100	~~11 × 14~~16 × 8.2

Table 4-7 Analytical Laboratory Sumps

Description	Location
RLD-SUMP-00041	Laboratory sump information for these sumps have been deleted and superceded by Sump Data for LAB Facility, 24590-LAB-PER-M-02-002 (DWP, Attachment 51, Appendix 11.5)
RLD-SUMP-00042	
RLD-SUMP-00043A	A-B007 C5 Pump Pit
RLD-SUMP-00043B	A-B005 C5 Pump Pit
RLD-SUMP-00044	A-B006 C5 Piping Pit
RLD-SUMP-00045	A-B002 C3 Pump Pit

Table 4-8 Pretreatment Plant Sumps

Table 4-8 was deleted and superceded by Sump Data for PT Facility, 24590-PTF-PER-M-02-006 (DWP, Attachment 51, Appendix 8.5) and Sump and Drain Data at 28 Ft Level of the PT Facility, 24590-PTF-PER-M-03-002 (DWP, Attachment 51, Appendix 8.5).

Table 4-9 LAW Vitrification Plant Sumps

Table 4-9 was deleted and superceded by LAW Facility Sump Data, 24590-LAW-PER-M -02-001 (DWP, Attachment 51, Appendix 9.8).

Table 4-10 HLW Vitrification Plant Sumps

Table 4-10 was deleted and superceded by HLW Facility Sump Data, 24590-HLW-PER-M-02-001 (DWP, Attachment 51, Appendix 10.5).

Table 4-11 Secondary Containment ~~Liner~~ in Cells and Caves in the WTP

Cell/Cave	Approximate Cell Dimensions (L×W, in feet)	Miscellaneous Treatment Systems, Subsystems, or Tanks in Cell/Cave (Largest Plant Item in Bold Type)	Volume of Largest ~~Tank~~ Plant Item in Cell/Cave (US Ggallons)	~~Calculated~~ Minimum Secondary Containment ~~Liner~~ Height (feet)
Pretreatment Plant				
~~Ultimate Overflow Pit~~P-B005 HLW Drain Vessel Pit	Minimum secondary containment for these cells/caves has been deleted and superceded by Flooding Volume for Below Grade and 0 Ft Level in PT Facility, 24590-PTF-PER-M-02-005			
P-B002 C2/C3 Drain Tank Room	(DWP Attachment 51, Appendix 8.8)~~22 × 5435 × 49~~			
~~Waste Feed Receipt Cell~~P-0102 HLW Receipt/Storage/Blending Cell	~~V15009B, V12002PWD-VSL-00033, PWD-VSL-00043~~ ~~23,000~~			
~~Waste Feed Evaporation Cell~~P-0102A HLW Receipt/Storage/Blending Cell	~~2.623.0~~ ~~22 × 49 and 17 × 8~~			
~~Waste Feed Ultrafiltration Cell~~P-0104 Ultrafiltration Cell	~~PWD-VSL-00045, PWD-VSL-00046~~ ~~4,982~~			
~~HLW Feed Blending and Lag Storage Cell~~P-0106 Feed Evaporator/Ultrafiltration Cell	~~4.5~~ ~~53 × 217 & 52 × 5356 × 52~~ ~~V11020A, V11020B, V11020C, V11020DHLP-VSL-00027A, HLP-VSL-00027B,~~			
~~Hot Cell~~P-0108 Feed Receipt Cell	~~PJV-VSL-00002~~			
~~South Process Bulge~~P-0108A Feed Receipt Cell	~~388,000~~ ~~3.71~~			
~~Northeast Process Bulge~~P-0108B Feed Receipt Cell	~~52 × 7872 × 52~~ ~~V11001A, V11001B, V11002A, V11002B, V12015A, V12015B, V12010A HLP-VSL-00022,~~			
~~Northwest Process Bulge~~P-0108C Feed Receipt Cell	~~HLP-VSL-00028, PVP-VSL-00001~~ ~~62,340~~			
~~Effluent Vessel Cell~~P-0109 Acidic/Alkaline Effluent Collection Cell	~~2.11~~ ~~52 × 9477 × 52~~			
~~Cesium Ion Exchange Removal Support Cell~~P-0111 Cesium Ion Exchange Cell	~~V12010B, V12015C, V12011A, V12011B, V15009A, V12007, V15052,~~			

Table 4-11 Secondary Containment ~~Liner~~ in Cells and Caves in the WTP

Cell/Cave	Approximate Cell Dimensions (L×W, in feet)	Miscellaneous Treatment Systems, Subsystems, or Tanks in Cell/Cave (Largest Plant Item in Bold Type)	Volume of Largest ~~Tank~~ Plant Item in Cell/Cave (US Ggallons)	~~Calculated~~ Minimum Secondary Containment ~~Liner~~ Height (feet)
~~Cesium Nitric Acid Recovery Cell~~P-0112 Cesium Effluent Recovery Cell ~~Technetium Eluant Recovery Cell~~ ~~Spent Resin Collection Cell~~	~~V15038UFP-VSL-00001B, UFP-VSL-00002A, UFP-VSL-00062C, PWD-VSL-00044,~~ ~~UFP-VSL-00002B, PVP-SCB-00002~~ ~~73,860~~ ~~2.11~~			
~~Technetium Ion Exchange Resin/Buffer Cell~~P-0117 Treated LAW Feed Cell	~~52 × 13287 × 52~~ ~~V12001A, V12001C, V12001D, V12001E, V15326, V15327FEP-VSL-00017A,~~			
~~Technetium Ion Exchange Column Cell~~P-0117A Treated LAW Feed Cell	~~FEP-VSL-00017B, UFP-VSL-00062A, UFP-VSL-00062B, UFP-VSL-00001A,~~ ~~FEP-SEP-00001A, FEP-SEP-00001B~~			
~~Treated LAW Buffer Storage~~P-0118 Alkaline Effluent Collection Cell	~~96,900~~ ~~1.91~~			
P-0123 Hot Cell				

Table 4-11 Secondary Containment ~~Liner~~ in Cells and Caves in the WTP

Cell/Cave	Approximate Cell Dimensions (L×W, in feet)	Miscellaneous Treatment Systems, Subsystems, or Tanks in Cell/Cave (Largest Plant Item in Bold Type)	Volume of Largest ~~Tank~~ Plant Item in Cell/Cave (US Ggallons)	~~Calculated~~ Minimum Secondary Containment ~~Liner~~ Height (feet)
~~LAW Buffer Vessel Cell~~P-0105, P-0105A, P-0105B, P-0105C South Process Areas				

Table 4-11 Secondary Containment ~~Liner~~ in Cells and Caves in the WTP

Cell/Cave	Approximate Cell Dimensions (L×W, in feet)	Miscellaneous Treatment Systems, Subsystems, or Tanks in Cell/Cave (Largest Plant Item in Bold Type)	Volume of Largest ~~Tank~~ Plant Item in Cell/Cave (US ~~G~~gallons)	~~Calculated~~ Minimum Secondary Containment ~~Liner~~ Height (feet)
Southeast, Southwest, and Northwest Process Areas: P-0201, P-0201A, P-0203, P-0203A, P-0203B, P-0204, P-0206, P-0207, P-0208, P-0209, P-0210, P-0212	Minimum secondary containment for these cells/caves has been deleted and superceded by Flooding Volume for 28 Ft Level in PT Facility, 24590-PTF-PER-M-03-001 (DWP Attachment 51, Appendix 8.8)~~60 × 20~~ ~~56 × 18~~ ~~45 × 18~~ ~~77 × 18~~ ~~89 × 18~~ ~~52 × 18~~ ~~30 × 18~~ ~~48 × 18~~ ~~51 × 18~~ ~~51 × 18~~ ~~30 × 19~~ ~~50 × 19~~ ~~30 × 19~~ ~~N/A~~ ~~20 minutes of fire water~~ ~~0.61~~			
P-0304 Waste Feed Evaporation Room	72 × 54	**FEP-SEP-00001A/B** FEP-DMST-00001A/B FEP-COND-00001A/1B/2A/2B/3A/3B	4,200	TBD
P-0320 Ion Exchange Evaporator Room	54 × 36	CNP-DISTC-00001 TEP-DISTC-00001	500	TBD
P-0325 Treated LAW Evaporator Room	54 × 36	**TLP-SEP-00001** TLP-COND-00001	4,200	TBD
P-0410 Utility Area Room	(90 × 36) +	PWD-RK-00001/14/18/20	N/A	TBD

Table 4-11 Secondary Containment ~~Liner~~ in Cells and Caves in the WTP

Cell/Cave	Approximate Cell Dimensions (L×W, in feet)	Miscellaneous Treatment Systems, Subsystems, or Tanks in Cell/Cave (Largest Plant Item in Bold Type)	Volume of Largest ~~Tank~~ Plant Item in Cell/Cave (US Ggallons)	~~Calculated~~ Minimum Secondary Containment ~~Liner~~ Height (feet)
	(36 × 18)	CXP-RK-00004 FRP-RK-00013 CNP-RK-00005 PWD-RK-00007/46 HPS-RK-00009 PWD-RK-00008 CXP-RK-00005/6/7 RDP-RK-00014/15		
P-0415 Utility Area Room	54 × 54	PWD-RK-00005/09/12 TLP-RK-00005/6/7	N/A	TBD
P-0423 Utility Area Room	81 × 54	UFP-RK-00067/68/69/70/71/72/73 PWD-RK-00004/06/13/17/51 HLP-RK-00007/8/9	N/A	TBD
P-0425 Utility Area Room	54 × 54	PWD-RK-00002/03/11/19 FRP-RK-00012/14/19 FEP-RK-00004/5/6/7/8	N/A	TBD
P-0430 Process Bulge Area	45 × 36	CNP-HX-00002/3	TBD	TBD
P-0514 PCW Head Tank Room	54 × 54	**SHR-TK-00009**	~~15,000~~14,900	TBD
Analytical Laboratory				
~~Effluent Collection Cell~~A-B003 Lab Area Sink Drain Collection Vessel Cell	Minimum secondary containment for these cells has been deleted and superceded by Flooding			

Table 4-11 Secondary Containment ~~Liner~~ in Cells and Caves in the WTP

Cell/Cave	Approximate Cell Dimensions (L×W, in feet)	Miscellaneous Treatment Systems, Subsystems, or Tanks in Cell/Cave (Largest Plant Item in Bold Type)	Volume of Largest ~~Tank~~ Plant Item in Cell/Cave (US ~~G~~gallons)	~~Calculated~~ Minimum Secondary Containment ~~Liner~~ Height (feet)
A-B004 Hot Cell Drain Collection Vessel Cell	Volume for LAB Facility, 24590-LAB-PER-M-02-001 (DWP, Attachment 51, Appendix 11.8).~~18 × 36~~~~27.25 × 13~~ ~~V60001a, V60001B~~~~RLD-VSL-00164~~ ~~12,063~~~~3,200~~ ~~4.0~~~~5.08~~ ~~29.21 × 21~~ ~~RLD-VSL-00165~~ ~~9,100~~ ~~4.0~~			
LAW Vitrification Plant				
L-~~186~~0123, Melter 1 Process Cell L-~~187~~0124, Melter 2 Process Cell ~~L-188, Melter 3 Process Cell~~ L-~~189~~0126, Effluent Cell L-B001B, C3/C5 Drains/Sump Collection Vessel Room	Minimum secondary containment for these cells has been deleted and superceded by *Flooding Volume for LAW Facility*, 24590-LAW-PER-M-02-003~~48 × 38~~ ~~V21001, V22101, V21102, V21101~~— ~~14,392~~ ~~1.4~~ ~~48 × 38~~ ~~48 × 38~~ —~~V21002, V22201, V21202, V21201~~ ~~V21002, V22301, V21302, V21301~~ ~~14,392~~ ~~14,392~~ ~~2.0~~~~1.4~~ ~~1.4~~ ~~38 × 31~~ ~~V25001, V25003~~— ~~25,130~~ ~~3.7~~~~4.5~~			

Table 4-11 Secondary Containment ~~Liner~~ in Cells and Caves in the WTP

Cell/Cave	Approximate Cell Dimensions (L×W, in feet)	Miscellaneous Treatment Systems, Subsystems, or Tanks in Cell/Cave (Largest Plant Item in Bold Type)	Volume of Largest ~~Tank~~ Plant Item in Cell/Cave (US Ggallons)	~~Calculated~~ Minimum Secondary Containment ~~Liner~~ Height (feet)
L-~~333~~0218, Caustic Scrub Blowdown Collection ~~Room~~Berm	~~31 × 27~~26 × 31	~~V22001~~**LVP-VSL-00001**	~~12,191~~~~13,240~~ 14,579	~~3.3~~TBD
HLW Vitrification Plant				
H-~~153~~B014 ~~, No. 1 — Tank Area~~Wet Process Cell North	Minimum secondary containment for these cells/caves has been deleted and superceded by Flooding Volume for HLW Facility, 24590-HLW-PER-M-02-003 (DWP, Attachment 51,			
H-B014 Wet Process Cell South	Appendix 10.8). ~~51 × 12×~~			
H-B021 SBS Drains Collection Cell No 1	~~V31001, V31002~~			
H-~~050~~0133, Canister ~~Bogie Decontamination~~ Swab and Monitoring ~~Room~~Cave	~~8,800~~344 ~~3.02~~			
H-~~051~~B039A, ~~Canister Rinse~~ Bogie Deon/Maint Tunnel Canister Rinse	~~×~~			
H-~~059~~B039B, Canister ~~Decontamination~~ Rinse~~Cell~~ Tunnel	~~3.9~~ ~~× 8~~			
H-~~035~~0304A, ~~SBS Drain Collection Cell No. 1~~Equipment Decontamination Area	~~.4~~			
H-~~027~~0117, ~~Wet Process Cell (south section)~~Melter Cave No. 1 (South)	~~6.1~~ ~~36 × 235×~~			
H-~~027~~0117, ~~Wet Process Cell (north section)~~Melter Cave No. 1 (West)	~~V33004, HDH-VSL-00004~~ ~~2,500~~26			
H-0310A, Equipment Decontamination Area	~~1.0~~.9			
H-106, Melter Cave No. 2 (South)	~~11 × 54×~~			
H-106, Melter Cave No. 2 (West)				

Table 4-11 Secondary Containment ~~Liner~~ in Cells and Caves in the WTP

Cell/Cave	Approximate Cell Dimensions (L×W, in feet)	Miscellaneous Treatment Systems, Subsystems, or Tanks in Cell/Cave (Largest Plant Item in Bold Type)	Volume of Largest ~~Tank~~ Plant Item in Cell/Cave (US Ggallons)	~~Calculated~~ Minimum Secondary Containment ~~Liner~~ Height (feet)
H-B005, SBS Drains Collection Cell No. 2				

Table 4-12 Containment Buildings Summary

Location	Approximate Dimensions (L × W × H, in feet)
Pretreatment Plant	
P-0123 Pretreatment Hot Cell Containment Building	~~414 × 54 × 46~~350 × 51 × 52
Pretreatment Maintenance Containment Building	
PM0124 ~~Pretreatment~~Hot Cell Crane Maintenance ~~Containment Building~~Area	~~(98 × 56 × 18) +~~ ~~(54 × 5 × 18) +~~ ~~(54 × 78 × 18) +~~ ~~(18 × 98 × 18)~~54 × 51× 52
P-0121A Spend Resin Dewatering	28 × 18 × 28
P-0122A Waste Packaging Area	26 × 51 × 28
P-0123A Remote Decontamination Maintenance Cave	55 × 51 × 28
P-0124 C3 Workshop	24 × 24 × 16
P-0124A C3 Workshop	(73 + 15 × 15) + (16 × 15 + 13)
P-0125 Filter Cask Airlock	24 × 20 × 28
P-0125A Filter Cask Area	28 × 18 × 28
P-0128A MSM Repair Area	24 × 18 × 28
P-0128 Temporary Storage Room	24 × 17 × 28
P-0223 Pretreatment ~~Air Filtration~~Filter Package Maintenance Containment Building	~~234 × 54 × 19~~40 × 20 × 28
P-0335 Pretreatment Air Filter Package Containment Building	118 × 54 × 42
LAW Vitrification Plant	
L-0112 LAW LSM Gallery Containment Building	151 × 60 × 24~~151 × 62 × 25~~
ILAW Container Finishing Containment Building	~~98 × 31 × 25~~
L-0109B Swabbing Area Line 2	21 × 15 × 24
L-0109C Decontamination Area Line 2	18 × 15 × 24
L-0109D Inert Fill Area Line 2	55 × 15 × 24
L-0115B Swabbing Area Line 1	21 × 15 × 24
L-0115C Decontamination Area Line 1	18 × 15 × 24

Table 4-12 Containment Buildings Summary

Location	Approximate Dimensions (L × W × H, in feet)
L-0115D Inert Fill Area Line 1	55 × 15 × 24
L-0116 Container Export	19 × 18 × 14
L-0116A Container Export	19 × 18 × 14
L-0119B LAW ~~Vitrification Plant C3 Workshop~~Consumable Import/Export Containment Building	35 × 40 × 20
L-226A LAW C3 Workshop Containment Building	40 × 35 × 19
LAW Pour Cave Containment Building	
L-B015A Melter 1 Pour Cave	16.5 × 20
L-B013C Melter 1 Pour Cave	16.5 × 20
L-B013B Melter 2 Pour Cave	16.5 × 20
L-B011C Melter 2 Pour Cave	16.5 × 20
L-B011B Future Melter 3 Pour Cave	16.5 × 20
L-B009B Future Melter 3 Pour Cave	16.5 × 20
ILAW Buffer Container Containment Building	
L-B025C	22 x 22 x 7.5
L-B025D	22 x 14 x 7.5
HLW Vitrification Plant	
H-0117, H-0116B, H-0310A HLW Melter No. 1	145 × 35 × 55
H-0106, H-0105B, H-0304A HLW Melters No. ~~1 and 2Containment Buildings~~	~~35 × 107 × 49~~145 × 35 × 55
H-0136 ~~IHLW Container Weld Containment Building~~ IHLW Canister Handling Cave Containment Building	140 × 18 × 48
H-B0133 IHLW5 ~~IHLW Container~~ Canister ~~Decontamination~~Swab and Monitoring ~~Building~~Cave Containment Building	10 × 80 × 58
~~H-0311,~~ H-0311A/B~~, H-0311B~~ HLW Vitrification Plant C3 Workshop Containment Building~~Containment Building~~	(30 × 27 × 19) + (33 × 15 × 19)
~~H-0103,~~ H-0104 HLW ~~Air Filtration Containment Building~~Filter Cave	104 × 38 × 19
H-B032 HLW Pour Tunnel No. 1 Containment Building	140 × 11 × 21
H-B005A HLW Pour Tunnel No. 2 Containment Building	140 × 11 × 21

Table 4-12 Containment Buildings Summary

Location	Approximate Dimensions (L × W × H~~,~~ in feet)
H-0410B, H0411 ~~H-410, H-410A, H-410B, and H-411~~ HLW Waste Handling Area Containment Building	TBD
~~H-0126A/B and~~ HLW ~~H-B028~~ Drum Swabbing and Monitoring Area	~~52 × 16 × 10 + 15 × 52 × 10~~
H-0126A/B Swabbing and Monitoring Area	52 × 16 × 10
H-B028 Cask Transfer Tunnel	15 × 52 × 10

Table 4-13 Categorization of Piping

Table 4-13 has been deleted and superceded by 24590-WTP-PER-PS-02-001, *Ancillary Equipment Pipe Support Design* (DWP, Attachment 51, Appendix 7.5)

~~**Seismic Categories**~~[a]
~~**Seismic Category I – SC I**~~
~~**Seismic Category II – SC II**~~
~~**Seismic Category III – SC III**~~
~~**Seismic Category IV – SC IV**~~

~~**Definition**~~

~~a Piping important to safety and which has a seismic safety function~~

~~a Piping important to safety, whose failure during a seismic event could prevent a Seismic Category I piping components from performing its seismic safety function~~

~~a Piping important to safety, but without seismic safety function~~

~~b Piping not important to safety, but which has an inventory of radioactive or hazardous material in an amount less than an important to safety significant quantity~~

~~a Piping not important to safety and without an inventory of radioactive or hazardous material, but require seismic protection.~~

~~**(I) Design Code and Analysis Methods for weight effects and thermal expansion or contraction effects**~~

~~**Pipe and Supports**~~

~~ASME B31.3 Code(Ref 8.1)~~
~~ASME B31.3 Code (Ref 8.1)~~
~~ASME B31.3 Code (Ref 8.1)~~
~~ASME B31.3 Code (Ref 8.1)~~

~~**(II) Analysis Methods for Seismic Loads**~~

~~**Pipe**~~

~~NC~~[b]
~~NC/F~~[d]
~~NC/F~~[d]
~~NC/F~~[d]

~~**Supports**~~

~~NF~~[e]
~~NF~~[e]
~~F~~[e]
~~F~~[e]

~~**Seismic Method**~~

~~Response Spectrum~~

~~Response Spectrum~~

~~UBC~~

~~UBC~~

~~**(III) Acceptance Criteria**~~

~~**Pipe**~~

~~NC [b]/B31.3~~

~~F~~ [e]

~~F~~ [e]

~~F~~ [e]

~~**Supports**~~

~~NF~~ [e]

~~NF~~ [e]

~~F~~ [e]

~~F~~ [e]

~~Notes:~~

[a] ~~Seismic Category V (SC-V) do not have any seismic design requirements. No analysis is required. The piping shall be installed per Building Code.~~

[b] ~~NC is defined as Section NC-3650 (Analysis of Nuclear Class 2 Piping Systems) of ASME Section III Code.~~

[c] ~~F is defined as Appendix F (Rules for Evaluation of Service Loadings with Level D service Limits (Faulted Condition)), as defined in ASME Section III Code.~~

[d] ~~NC/F is defined to apply Appendix F to meet ASME Section III, NC Code requirements.~~

[e] ~~NF is defined as Section NF (for Pipe Supports) of ASME Section III Code.~~

Table 4-14 WTP Facility Miscellaneous Treatment Systems and Sub-Systems

No.	System/ Subsystem	Component Number	Description	Material	Maximum Volume* (gallons)
Pretreatment Facility					
1	CNP	CNP-EVAP-00001	Separator Vessel	Hastelloy	NA
2	CNP	CNP-HX-00001	Cesium Evaporator Concentrate Reboiler	Stainless Steel	NA
3	CNP	CNP-DISTC-00001	Cesium Nitric Acid Rectifier Column	Stainless Steel	NA
4	CNP	CNP-HX-00002	Cesium Evaporator Primary Condenser	Stainless Steel	NA
5	CNP	CNP-HX-00003	Cesium Evaporator Secondary Condenser	Stainless Steel	NA
6	CNP	CNP-HX-00004	Cesium Evaporator After-Condenser	Stainless Steel	NA
7	CNP	CNP-HEPA-00006	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
8	FEP	FEP-SEP-00001A	Waste Feed Evaporator Separator Vessel	Stainless Steel	NA
9	FEP	FEP-SEP-00001B	Waste Feed Evaporator Separator Vessel	Stainless Steel	NA
10	FEP	FEP-RBLR-00001A	Reboiler	Stainless Steel	NA
11	FEP	FEP-RBLR-00001B	Reboiler	Stainless Steel	NA
12	FEP	FEP-COND-00001A	Primary Condenser	Stainless Steel	NA
13	FEP	FEP-COND-00001B	Primary Condenser	Stainless Steel	NA
14	FEP	FEP-COND-00002A	Inter-Condenser	Stainless Steel	NA
15	FEP	FEP-COND-00002B	Inter-Condenser	Stainless Steel	NA
16	FEP	FEP-COND-00003A	After-Condenser	Stainless Steel	NA
17	FEP	FEP-COND-00003B	After-Condenser	Stainless Steel	NA
18	PJV	PJV-FLTH-00001A	Air In-Bleed Filter	Synthetic Fibrous Materials/Stainless Steel	NA
19	PJV	PJV-FLTH-00001B	Air In-Bleed Filter	Synthetic Fibrous Materials/Stainless Steel	NA
20	PJV	PJV-HEPA-00001A	Primary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
21	PJV	PJV-HEPA-00001B	Primary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
22	PJV	PJV-HEPA-00001C	Primary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
23	PJV	PJV-HEPA-00001D	Primary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
24	PJV	PJV-HEPA-00001E	Primary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
25	PJV	PJV-HEPA-00001F	Primary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
26	PJV	PJV-HEPA-00001G	Primary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
27	PJV	PJV-HEPA-00002A	Secondary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
28	PJV	PJV-HEPA-00002B	Secondary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
29	PJV	PJV-HEPA-00002C	Secondary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
30	PJV	PJV-HEPA-00002D	Secondary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
31	PJV	PJV-HEPA-00002E	Secondary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA

Table 4-14 WTP Facility Miscellaneous Treatment Systems and Sub-Systems

No.	System/ Subsystem	Component Number	Description	Material	Maximum Volume* (gallons)
32	PJV	PJV-HEPA-00002F	Secondary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
33	PJV	PJV-HEPA-00002G	Secondary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
34	PJV	PJV-FAN-00001A	Exhaust Fan	Stainless Steel	NA
35	PJV	PJV-FAN-00001B	Exhaust Fan	Stainless Steel	NA
36	PJV	PJV-FAN-00001C	Exhaust Fan	Stainless Steel	NA
37	PJV	PJV-DMST-00002A	Demister	Mesh Pad/ Stainless Steel	NA
38	PJV	PJV-DMST-00002B	Demister	Mesh Pad/ Stainless Steel	NA
39	PJV	PJV-DMST-00002C	Demister	Mesh Pad/ Stainless Steel	NA
40	PVP	PVP-HTR-00001A	Electric Heater	Stainless Steel	NA
41	PVP	PVP-HTR-00001B	Electric Heater	Stainless Steel	NA
42	PVP	PVP-HTR-00001C	Electric Heater	Stainless Steel	NA
43	PVP	PVP-ABS-00001A	Carbon Bed Adsorber	TEDA/Stainless Steel	NA
44	PVP	PVP-ABS-00001B	Carbon Bed Adsorber	TEDA/Stainless Steel	NA
45	PVP	PVP-CLR-00001	After-Cooler	Stainless Steel	NA
46	PVP	PVP-OXID-00001	VOC Oxidizer Unit	Stainless Steel	NA
47	PVP	PVP-FILT-00001A	Adsorber Outlet Filter	Synthetic Fibrous Materials/Stainless Steel	NA
48	PVP	PVP-FILT-00001B	Adsorber Outlet Filter	Synthetic Fibrous Materials/Stainless Steel	NA
49	PVP	PVP-HEME-00001A	HEME Filter	Packed Fiber Bed/Stainless Steel	NA
50	PVP	PVP-HEME-00001B	HEME Filter	Packed Fiber Bed/Stainless Steel	NA
51	PVP	PVP-HEME-00001C	HEME Filter	Packed Fiber Bed/Stainless Steel	NA
52	PVP	PVP-HEPA-00001A	Primary HEPA Filters	Synthetic Fibrous Materials/Stainless Steel	NA
53	PVP	PVP-HEPA-00001B	Primary HEPA Filters	Synthetic Fibrous Materials/Stainless Steel	NA
54	PVP	PVP-HEPA-00001C	Primary HEPA Filters	Synthetic Fibrous Materials/Stainless Steel	NA
55	PVP	PVP-HEPA-00002A	Secondary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
56	PVP	PVP-HEPA-00002B	Secondary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
57	PVP	PVP-HEPA-00002C	Secondary HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
58	PVP	PVP-HEPA-00023	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
59	PVP	PVP-HEPA-00024	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
60	PVP	PVP-HEPA-00028	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
61	PVP	PVP-HEPA-00029	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
62	PVP	PVP-HEPA-00030	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
63	PVP	PVP-HEPA-00031	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA

Table 4-14 WTP Facility Miscellaneous Treatment Systems and Sub-Systems

No.	System/ Subsystem	Component Number	Description	Material	Maximum Volume* (gallons)
64	PVP	PVP-HEPA-00032	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
65	PVP	PVP-HEPA-00033	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
66	PVP	PVP-HEPA-00034	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
67	PVP	PVP-HEPA-00035	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
68	PVP	PVP-SCB-00002	Caustic Scrubber	Metal Intalox Packing/ Stainless Steel	3,237
69	PVP	PVP-FAN-00001A	Exhaust Fan	Stainless Steel	NA
70	PVP	PVP-FAN-00001B	Exhaust Fan	Stainless Steel	NA
71	TLP	TLP-SEP-00001	Treated LAW Evaporator Separator Vessel	Stainless Steel	NA
72	TLP	TLP-RBLR-00001	Reboiler	Stainless Steel	NA
73	TLP	TLP-COND-00001	Primary Condenser	Stainless Steel	NA
74	TLP	TLP-COND-00002	After-Condenser	Stainless Steel	NA
75	TLP	TLP-COND-00003	Inter-Condenser	Stainless Steel	NA
76	TLP	TLP-HEPA-00001	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
LAW Vitrification					
1	LOP	LOP-FCLR-00001	Primary Film Cooler	Stainless Steel	NA
2	LOP	LOP-FCLR-00002	Secondary Film Cooler	Stainless Steel	NA
3	LOP	LOP-FCLR-00003	Primary Film Cooler	Stainless Steel	NA
4	LOP	LOP-FCLR-00004	Secondary Film Cooler	Stainless Steel	NA
5	LOP	LOP-SCB-00001	Melter 1 Submerged Bed Scrubber	Ceramic Packing/Hastelloy	4,948
6	LOP	LOP-SCB-00002	Melter 2 Submerged Bed Scrubber	Ceramic Packing/Hastelloy	4,948
7	LOP	LOP-WESP-00001	Melter 1 Wet Electrostatic Precipitator	6% Molybdenum/Stainless Steel	6,347
8	LOP	LOP-WESP-00002	Melter 2 Wet Electrostatic Precipitator	6% Molybdenum/Stainless Steel	6,347
9	LMP	LMP-MLTR-00001	LAW Melter	Stainless Steel/Alloys	1,860
10	LMP	LMP-MLTR-00002	LAW Melter	Stainless Steel/Alloys	1,860
11	LVP	LVP-SCB-00001	Caustic Scrubber	Metal Intalox Packing/Stainless Steel	3,237
12	LVP	LVP-HEPA-00001A	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
13	LVP	LVP-HEPA-00001B	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
14	LVP	LVP-HEPA-00002A	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
15	LVP	LVP-HEPA-00002B	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
16	LVP	LVP-SCO-00001	Selective Catalytic Oxidizer	Stainless Steel	NA
17	LVP	LVP-SCR-00001	Selective Catalytic Reduction Unit	Stainless Steel	NA
18	LVP	LVP-SCR-00002	Selective Catalytic Reduction Unit	Stainless Steel	NA

Table 4-14 WTP Facility Miscellaneous Treatment Systems and Sub-Systems

No.	System/ Subsystem	Component Number	Description	Material	Maximum Volume* (gallons)
19	LVP	LVP-HTR-00001A	Electric Heater	Stainless Steel	NA
20	LVP	LVP-HTR-00001B	Electric Heater	Stainless Steel	NA
21	LVP	LVP-HTR-00002	Electric Heater	Stainless Steel	NA
22	LVP	LVP-HTR-00003A	Electric Heater	Stainless Steel	NA
23	LVP	LVP-HTR-00003B	Electric Heater	Stainless Steel	NA
24	LVP	LVP-HX-00001	Heat Exchanger	Stainless Steel	NA
25	LVP	LVP-ADBR-00001	Adsorber	Stainless Steel	NA
26	LVP	LVP-EXHR-00001A	Melter Offgas Exhausters	Stainless Steel	NA
27	LVP	LVP-EXHR-00001B	Melter Offgas Exhausters	Stainless Steel	NA
28	LVP	LVP-EXHR-00001C	Melter Offgas Exhausters	Stainless Steel	NA
HLW Vitrification					
1	HMP	HMP-MLTR-00001	Melter 1	Stainless Steel/Alloys	1,078
2	HMP	HMP-MLTR-00002	Melter 2	Stainless Steel/Alloys	1,078
3	HOP	HOP-WESP-00001	Wet Electrostatic Precipitators	6% Molybdenum/ Stainless Steel	NA
4	HOP	HOP-WESP-00002	Wet Electrostatic Precipitators	6% Molybdenum/Stainless Steel	NA
5	HOP	HOP-SCO-00001	Offgas Organic Oxidizer	Stainless Steel	NA
6	HOP	HOP-SCO-00004	Offgas Organic Oxidizer	Stainless Steel	NA
7	HOP	HOP-SCR-00001	NOx Selective Catalytic Reducer	Stainless Steel	NA
8	HOP	HOP-SCR-00002	NOx Selective Catalytic Reducer	Stainless Steel	NA
9	HOP	HOP-ABS-00002	Silver Mordenite Column	Calcium Silicate/ Stainless Steel	NA
10	HOP	HOP-ABS-00003	Silver Mordenite Column	Calcium Silicate/ Stainless Steel	NA
11	HOP	HOP-FCLR-00001	Film Cooler	Stainless Steel	NA
12	HOP	HOP-FCLR-00002	Film Cooler	Stainless Steel	NA
13	HOP	HOP-HEPA-00001A	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
14	HOP	HOP-HEPA-00001B	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
15	HOP	HOP-HEPA-00002A	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
16	HOP	HOP-HEPA-00002B	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
17	HOP	HOP-HEPA-00007A	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
18	HOP	HOP-HEPA-00007B	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
19	HOP	HOP-HEPA-00008A	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
20	HOP	HOP-HEPA-00008B	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
21	HOP	HOP-HTR-00001B	HEPA Electric Heater	Stainless Steel	NA

Table 4-14 WTP Facility Miscellaneous Treatment Systems and Sub-Systems

No.	System/ Subsystem	Component Number	Description	Material	Maximum Volume* (gallons)
22	HOP	HOP-HTR-00002A	HEPA Electric Heater	Stainless Steel	NA
23	HOP	HOP-HTR-00005A	HEPA Electric Heater	Stainless Steel	NA
24	HOP	HOP-HTR-00005B	HEPA Electric Heater	Stainless Steel	NA
25	HOP	HOP-HX-00001	Heat Exchanger	Stainless Steel	NA
26	HOP	HOP-HX-00002	Heat Exchanger	Stainless Steel	NA
27	HOP	HOP-HX-00003	Heat Exchanger	Stainless Steel	NA
28	HOP	HOP-HX-00004	Heat Exchanger	Stainless Steel	NA
29	HOP	HOP-FAN-00001A	Booster Extraction Fans	Stainless Steel	NA
30	HOP	HOP-FAN-00001B	Booster Extraction Fans	Stainless Steel	NA
31	HOP	HOP-FAN-00001C	Booster Extraction Fans	Stainless Steel	NA
32	HOP	HOP-FAN-00008A	Stack Extraction Fans	Stainless Steel	NA
33	HOP	HOP-FAN-00008B	Stack Extraction Fans	Stainless Steel	NA
34	HOP	HOP-FAN-00008C	Stack Extraction Fans	Stainless Steel	NA
35	HOP	HOP-FAN-00009A	Booster Extraction Fans	Stainless Steel	NA
36	HOP	HOP-FAN-00009B	Booster Extraction Fans	Stainless Steel	NA
37	HOP	HOP-FAN-00009C	Booster Extraction Fans	Stainless Steel	NA
38	HOP	HOP-FAN-000010A	Stack Extraction Fans	Stainless Steel	NA
39	HOP	HOP-FAN-000010B	Stack Extraction Fans	Stainless Steel	NA
40	HOP	HOP-FAN-000010C	Stack Extraction Fans	Stainless Steel	NA
41	HOP	HOP-ADBR-00001A	Activated Carbon Column	Stainless Steel	NA
42	HOP	HOP-ADBR-00001B	Activated Carbon Column	Stainless Steel	NA
43	HOP	HOP-ADBR-00002A	Activated Carbon Column	Stainless Steel	NA
44	HOP	HOP-ADBR-00002B	Activated Carbon Column	Stainless Steel	NA
45	HOP	HOP-HEME-00001A	HEME	Packed Fiber Bed/Stainless Steel	NA
46	HOP	HOP-HEME-00001B	HEME	Packed Fiber Bed/Stainless Steel	NA
47	HOP	HOP-HEME-00002A	HEME	Packed Fiber Bed/Stainless Steel	NA
48	HOP	HOP-HEME-00002B	HEME	Packed Fiber Bed/Stainless Steel	NA
49	HOP	HOP-SCB-00001	Submerged Bed Scrubber	Ceramic Packing/Alloy 22	4,516
50	HOP	HOP-SCB-00001	Air Ejector Induced Siphon (located on SBS)	Stainless Steel	NA
51	HOP	HOP-SCB-00002	Submerged Bed Scrubber	Ceramic Packing/Alloy 22	4,516
52	HOP	HOP-SCB-00002	Air Ejector Induced Siphon (located on SBS)	Stainless Steel	NA
53	PJV	PJV-HEPA-00004A	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA

Table 4-14 WTP Facility Miscellaneous Treatment Systems and Sub-Systems

No.	System/ Subsystem	Component Number	Description	Material	Maximum Volume* (gallons)
54	PJV	PJV-HEPA-00004B	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
55	PJV	PJV-HEPA-00005A	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
56	PJV	PJV-HEPA-00005B	HEPA Filter	Synthetic Fibrous Materials/Stainless Steel	NA
57	PJV	PJV-HTR-00002	Electric Heater	Stainless Steel	NA
58	PJV	PJV-FAN-00002A	Pulse Jet Fans	Stainless Steel	NA
59	PJV	PJV-FAN-00002B	Pulse Jet Fans	Stainless Steel	NA